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Further Studies on the Serpents of Costa Rica

By

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ABSTRACT: Additional collections of reptiles from Costa Rica made in 1951 and 1952 include some 90 species or subspecies of snakes, bringing the known serpent fauna of the country to 151 forms. In this work the following new species or subspecies are described: *Geophis bakeri, Geophis zeledoni, Geophis acutirostris, Ninia cerroensis, Dryadophis sanguiventris, Pliocercus arubricus, Rhadinaea altamontanus, Rhadinaea decipiens rubricollis, Tantilla costaricensis, Dipsas tenuissima, Bothrops schlegelii supraciliaris.*

Certain species are included that did not appear in Taylor's "A Review of the Serpents of Costa Rica," 1952. These are *Loxocemus bicolor* Cope, *Trimetopon sleveni* Dunn, *Leptophis nebulosus* Oliver, *Leptophis aeruginosus* Cope, *Leptophis richardi praestans* Cope, *Dendrophidion vinitor* Smith.

INTRODUCTION

My study of the herpetological faunas of Costa Rica, begun in 1947, has been continued to date, and has involved three Costa Rican expeditions. The first, undertaken at the request of the Rector of the National University of Costa Rica, extended from June 21 to September 7, 1947. A few localities were visited and a collection, consisting of many hundreds of specimens, was obtained. The second expedition extended from June 26 to September 14, 1951. The third expedition began work in Costa Rica June 6, 1952, and kept in the field until September 14 of the same year. Using as a basis the materials obtained by myself and Richard Clark Taylor in 1947, I prepared a brief Review of the Snakes of Costa Rica which appeared October 1, 1951. In this work short descriptions of the species taken, together with descriptions or synopses of other species presumed to occur within the confines of Costa Rica, were given. Twenty-four species were illustrated.

In the collections of 1951 and 1952 there are some 90 species of

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snakes represented. With this material available it has been possible to modify certain ideas that I held regarding several forms; to extend the known distribution of several species, and the range of variation in others; to discover errors in statement in previous works, including my own; and to report certain forms regarded as new. In consequence I am presenting this added information here in the form of a supplement to my preceding work.

COLLECTING LOCALITIES

Among the localities visited were the following:

1. LOS DIAMANTES. An experimental rubber plantation about 2½ kilometers south of Guápiles, elevation 250 m.
2. La Lola. Experimental cacao plantation in the eastern lowlands.
3. Limón. Seaport on the Caribbean coast. Collecting was done within a radius of about three to four kilometers from the city. One trip was made on the railway to Mountain Cow Creek, southwest of Limón, in the neighboring hills.
4. Bataan. The abaca plantation of the United Fruit Company in the eastern lowlands.
5. Tunnel Camp. A point on the railway near Lake Bonilla, a small natural lake, about 10 km. east of Peralta, and at a somewhat lower elevation.
6. Turrialba and the nearby farm of the Inter-American Institute of Agriculture; elevation 624 m.
7. Santa Cruz. Village on the south slopes of Volcán Turrialba, elevation about 1,540 m. Collecting was done within a two or three kilometer radius from the town.
8. Cervantes. A village on the highway, between Turrialba and Cartago, about 11 km. east of Cartago. The region has much lava, some exposed at the surface. Elevation about 1,215-1,400 m. in the area where collections were made.
9. Cot. A village on the slopes of Volcán Irazú about 7 km. from Cartago. The elevation is about 1,580 m.
10. Curridabat. Town about 6.5 km. east of San José.
11. Escazú. Town about 6.5 km. southwest of San José on the mountain slopes. Elevation somewhat higher than San José.
12. Esparta. A small town in Puntarenas Province about 10 km. from the Golfo de Nicoya; probably not over 215 m. elevation.
13. El General or El General de Térraba. Elevation of about 625 m., San José Province, Pacific drainage.

14. Moravia (de Chirripo). Large finca. Most of the collecting was done within a two to five km. radius of the central village, at elevations of approx. 615 to 915 m.
15. Pacuare. A point where the auto road crosses the Río Pacuare, between Turrialba and Moravia de Chirripo, elevation estimated at 615 m.
16. Palmar. A village and site of United Fruit Company installations about 15 km. from the mouth of the Río Diquis (Río Grande de Térraba) near the pass in the Cordillera Brunquena. Collecting was done along the river, and in the low mountains north of the river.
17. Las Esquinas. A settlement and forest preserve of the United Fruit Company not far from the Río Esquinas between Palmar and Golfito on the railway. The rainfall here is extremely heavy.
18. Volcán Poás. A volcano still showing some activity; elevation 2,780 meters. Collecting done on southern, eastern, and northeastern slopes at various elevations.
19. San Isidro del General (sometimes written San Isidro el General). A town on the west slope of the Sierra Talamanca on the Pan-American Highway; elevation 715 m.
20. Sarchi. A small village on the Pan-American Highway between Grecia and Naranjo. Collecting was done a few kilometers east on the highway along a small stream.
21. Tenorio (de Las Cañas). Cattle ranch of the United Fruit Company in Guanacaste, from about 215 m. in the western part, up to 550 m. elevation in the east. The central installations and air field are at about 400 m.
22. Las Flores. A tiny settlement northeast of Tenorio on the ranch; elevation 475 m.; also Tenorito, 550 m.
23. Hotel Maribella. A settlement and hotel at the definitive mouth of the Río Barranca, on the west coast, at sea level.
24. Zarcero. A town north of Naranjo.
25. Villa Quesada. About 13 km. north of Naranjo and Zarcero.
26. Cariblanco. In northeastern lowlands, almost directly north of San José, at the base of the northern slope of Volcán Poás. Approximately 460 m. (?) elevation, a place with heavy rainfall.
27. Cinchona. Formerly American Cinchona Plantation or Isla Bonita, 1,520-1,675 m. elevation. Now a school.

28. Isla Bonita. The eastern part of the former American Cinchona Plantation, now a large finca being prepared for a cafetal (1952).
29. Alejuela. City, altitude about 950 m.
30. Atirro. Village on Río Reventazón, about 6.5 km. from Turrialba, of nearly the same elevation as preceding.
31. Volcán Barba. An extinct volcano lying north of the city of San José with an elevation of 2,929 m. Collections were made chiefly on the southern and western slopes at an elevation of from 1,000-2,000 m.
32. Barranca. Puntarenas Province. A small village about 10 km. from the mouth of the Río Barranca. Elevation about 75 m.
33. Puntarenas. Puntarenas Province. Situated at the end of an extremely narrow peninsula extending into the Golfo de Nicoya, at sea level.
34. La Carpintera. Mountain, somewhat between Cartago and San José, south of Tres Rios, reaching an elevation of approximately 1,825 m., the terminus of the Candalaria Mountains.
35. Cartago. On the Meseta Central. The second largest city in Costa Rica.
36. Costa Rican National Forest. A forest preserve on the Pan-American Highway south of Cartago above Empalme at an elevation of approximately 2,280 m.
37. Dominical Road. This runs from San Isidro del General to Dominical on the Pacific coast. Its direction is generally west-southwest. Localities are indicated in distances from San Isidro. At some points it probably reaches an elevation 600 m. or higher.
38. Golfito. United Fruit Company installation on Golfo Dulce, at sea level. A region of heavy rainfall.
39. Millville. Pan-American Highway installation on the Pacific slope of the Cerro de la Muerte at an elevation of 2,862 m. Collecting was done at the summit of the Cerro de la Muerte (3,300 m.), and at approximately 350 m. above and below Millville.
40. Boquete Camp. On west slope of Cerro de la Muerte at about 2,000 m.

CHECKLIST OF COSTA RICAN SNAKES

The following species are now included in the list of Costa Rican snakes.

Anomalepis Jan
dentatus Taylor
Liotyphlops Peters
albirostris (Peters)
Helminthophis Peters
frontalis (Peters)
Leptotyphlops Fitzinger
albifrons (Wagler)
Loxocemus
[* *bicolor* Cope]
Boa Linnaeus
annulata (Cope)
Constrictor Laurenti
* *constrictor imperator* (Daudin)
Epicrates Wagler
cenchria maurus Gray
Nothopsis Cope
* *torresi* Taylor
Scaphiodontophis Taylor and Smith
* *venustissimus* (Günther)
Thamnophis Fitzinger
sirtalis chaleeus (Cope)
Geophis Wagler
[* *rhodogaster* (Cope)]
* *godmani* Boulenger
* *hoffmanni* (Peters)
* *dolichocephalus* (Cope)
* *moestus* (Günther)
* *brachycephalus* (Cope)
* *bakeri* sp. nov.
* *acutirostris* sp. nov.
* *zeledoni* sp. nov.
Ninia Baird and Girard
* *sebae sebae* (Duméril, Bibron, and Duméril)
* *atrata* (Hallowell)
* *maculata* (Peters)
* *tessellata* Cope
psephota (Cope)
* *oxynota* (Werner)
* *cerrocnsis* sp. nov.
Sibon Fitzinger
* *nebulatus* (Linnaeus)
Tretanorhinus Duméril, Bibron, and Duméril
nigroluteus nigroluteus Cope

* Indicates species discussed in this paper. Brackets indicate doubtful records.

Xenodon Boie
* *bertholdi* Jan
* *colubrinus* Günther
Emulus
flavitorques (Cope)
* *sclateri* (Boulenger)
Helicops Wagler
wettsteini Amaral
Hydromorphus Peters
* *concolor* Peters
Trimetopon Cope
* *pliolepis* Cope
viquezi Dunn
simile Dunn
* *sleveui* Dunn
* *gracile* (Günther)
Hypsiglena Cope
* *torquata torquata* (Günther)
Amastridium
* *veliferum* Cope
Spilotes Wagler
* *pullatus pullatus* (Linnaeus)
pullatus mexicanus (Laurenti)
Leptophis Bell
* *mexicanus mexicanus* Duméril, Bibron, and Duméril
depressirostris (Cope)
* *nebulosus* Oliver
* *ahaetulla occidentalis* (Günther)
* *ahaetulla praestans* (Cope)
* *aeruginosus* Cope
Dryadophis Stuart
* *melanolomus alternatus* (Bocourt)
* *sanguiventris* sp. nov.
Drymobius Fitzinger
* *margaritiferus margaritiferus* (Schlegel)
* *rhombifer* (Günther)
* *chloroticus* (Cope)
* *melanotropis* Cope
Dendrophidion Fitzinger
paucicarinatus (Cope)
* *percarinatus* (Cope)
* *vinitor* Smith
Pseustes Fitzinger
* *poecilonotus chrysobronchus* (Cope)
* *shropshirei* (Barbour and Amaral)
Chironius Fitzinger
carinatus (Linnaeus)
* *grandisquamis* (Peters)
* *melas* (Cope)

Elaphe Fitzinger
triaspis Cope
flavirufa flavirufa (Cope)
Drymarchon Fitzinger
* *corais melanurus* (Duméril, Bibron, and Duméril)
Masticophis Baird and Girard
mentovarius (Duméril, Bibron, and Duméril)
Leptodrymus Amaral
pulcherrimus (Cope)
Leimadophis Fitzinger
* *taeniurus juvenilis* Dunn
Lampropeltis Fitzinger
† *doliata micropholis* Cope
doliata polyzona Cope
doliata gaigae Dunn
Pliocercus Cope
dimidiatus Cope
annellatus Taylor
* *arubricus* sp. nov.
Liophis Wagler
cobella (Linnaeus)
Rhadinaea Cope
* *decorata decorata* (Günther)
* *serperaster* Cope
calligaster (Cope)
decipiens decipiens (Günther)
* *decipiens rubricollis* subsp. nov.
* *altamontanus* sp. nov.
pulveriventris Boulenger
vermiculaticeps (Cope)
* *persimilis* Dunn
pachyura (Cope)
Trimorphodon Cope
biscutatus biscutatus (Duméril, Bibron, and Duméril)
Leptodeira Fitzinger
* *nigrofasciata* Günther
rubricata (Cope)
* *annulata annulata* (Linnaeus)
* *ocellata* Günther
* *rhombifera* Günther
maculata (Hallowell)
Oxybelis Wagler
fulgidus (Daudin)
* *brevirostris* (Cope)
* *aeneus* (Wagler)

† A recent work of Mittleman states that the name *doliata* applies to *Cemophora* in which case it will invalidate its use for a species of *Lampropeltis*. However, in neither usage is there absolute certainty. For the time being I shall continue to use the name *doliata* for Costa Rican *Lampropeltis*.

Imantodes Duméril and Bibron
* *inornatus* Boulenger
* *cenchoa semifasciatus* Cope
* *gemmistratus* Cope
Clelia Fitzinger
* *clelia clelia* (Daudin)
* *petolaria* (Linnaeus)
Erythrolamprus Boie
* *bizonus* Jan
Coniophanes Hallowell
decipiens (Günther)
piceivittis Cope
* *fissidens punctigularis* Cope
Rhinobothryum Wagler
bovalii Anderson
Conophis Peters
lineatus dunni Smith
nevermanni Dunn
Stenorrhina Duméril
* *degenhardtii degenhardtii* (Berthold)
degenhardtii apiata Cope
freminvillii freminvillii Duméril, Bibron, and Duméril
Scolecophis Fitzinger
atrocinctus (Schlegel)
Tantilla Baird and Girard
* *annulata* Boettger
* *armillata* Cope
reticulata Cope
virgata Günther
* *shistosa* (Bocourt)
ruficeps Cope
* *costaricensis* sp. nov.
Dipsas Laurenti
* *anthracops* (Cope)
pictiventris (Cope)
argus (Cope)
articulata (Cope)
* *annulata* (Günther)
ruthveni Barbour and Dunn
costaricensis Taylor
* *tenuissima* sp. nov.
Neopareas Günther
bicolor Günther
Pelamis Daudin
platurus (Linnaeus)
Micrurus Wagler
* *mipartitus multifasciatus* Jan
* *nigrocinctus nigrocinctus* (Girard)
* *nigrocinctus mosquitensis* Schmidt
nigrocinctus yatesi Dunn

nigrocinctus alleni Schmidt
clarki Schmidt
richardi Taylor
pachecoi Taylor
Bothrops Wagler
* *atrox asper* (Garman)
* *nummifer nummifer* (Rüppell)
* *picadoi* (Dunn)
* *nasutus* Bocourt
* *ophryomegas* Bocourt
lansbergii (Schlegel)
* *nigroviridis nigroviridis* (Peters)
* *lateralis* (Peters)
godmani (Günther)
* *schlegelii schlegelii* (Berthold)
* *schlegelii supraciliaris* subsp. nov.
Crotalus Linnaeus
* *durissus durissus* (Linnaeus)
Lachesis Daudin
muta stenophrys Cope

REPORT OF SPECIES

[*Loxocemus bicolor* Cope]

Loxocemus bicolor Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 13, 1861, p. 77 (type locality La Union, Dept. La Union, El Salvador); Smith and Taylor, U. S. Nat. Mus. Bull. 187, 1945, p. 27; Mertens, Abh. Senckenb. naturf. Ges., No. 487, Jan. 12, 1952, p. 60.

This species may be diagnosed by the following: premaxillary bone toothed; head covered with symmetrical shields; rostral large, projecting; loreal absent; a pair of internasals; frontal in contact with a large occipital shield; pupil vertical; scales smooth, in 31-33 rows; part of rostral visible above one half to two thirds of its distance from prefrontal; frontal separating the parietals, but touching occipital; one or two preoculars, three or four post- and suboculars; supralabials, 9-11; infralabials, 12-13; temporals, 3+3 (or 4). Ventrals, 242-265; anal divided; subcaudals 39-47. Lavender-grey to purplish brown, sometimes with scattered yellow spots.

I regard this as doubtful for Costa Rica.

Constrictor constrictor imperator (Daudin)

Fig. 1.

Boa imperator Daudin, Histoire Naturelle . . . Reptiles, vol. 5, 1803, pp. 150-152 (type locality, "Mexico" restricted to Córdoba, Veracruz, Mexico, by Smith and Taylor).
Constrictor constrictor imperator Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 29.

Among the snakes of the collection is a small boa (K.U.M.N.H. No. 31944) that was presented alive to me by Sr. Alfonso Trejos

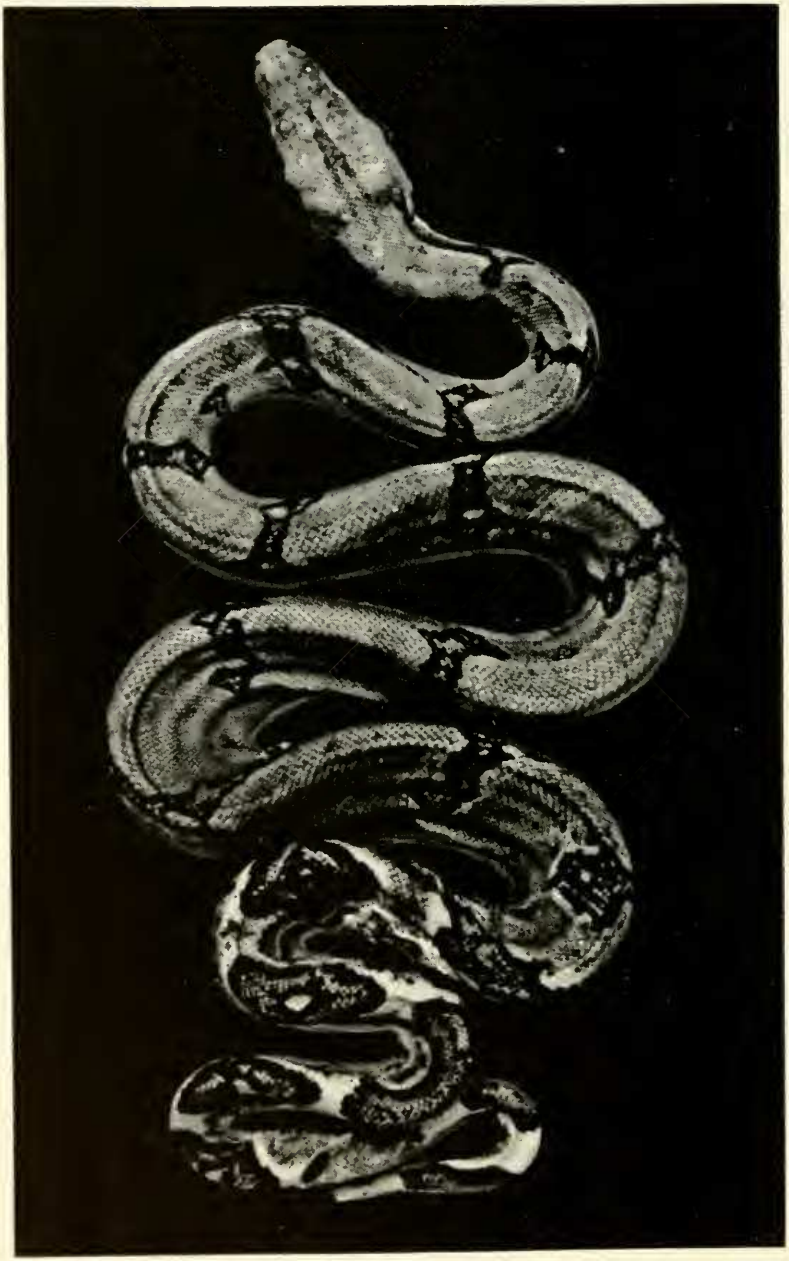

FIG. 1. *Constrictor constrictor imperator* (Daudin). K.U.M.N.H. No. 31944; Costa Rica. This specimen varies from the more typical form occurring in Central America. (About natural size.)

of the Hospital San Juan de Dios, San José, C. R., the snake having been sent, presumably, from some locality in Guanacaste. There are several characters by which it differs from the more typical form. The two most distinctive ones being, a much lighter dorsal ground color, which is rather a lavender-gray and the great reduction in the size of the twelve anterior blotches, which are three to three and a half scale-lengths wide mesially and even on the side are reduced to a maximum width of nine or ten scales. In the more typical form the blotches are usually ten to thirteen scale-lengths wide mesially and laterally 16 to 20. In the typical specimens there is a lateral series of ocellated spots, which in this is barely indicated by scarcely noticeable, shadowlike spots. In this, the ventral surface from chin to past the middle of venter is a light grayish lavender, the fine pigment showing some variation in intensity. The median stripe on the head is dim without a crossbar and the diagonal stripe behind the eye is reduced in width; the black spots on the lower lips (2 on each side) are reduced and relatively dim. There are 13 scales surrounding the eye, three somewhat enlarged preoculars, three suboculars touching labials, two postoculars, of which one is elongate, and five supraoculars.

Two other specimens having the more typical pattern are in the collection: No. 34889 from Turrialba and No. 34901, from Golfito, Puntarenas Province.

Nothopsis torresi Taylor

Nothopsis torresi Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 31-34, pl. 1 (type locality, 5 miles SW Turrialba, Costa Rica, Morehouse [not Morehead] Finca).

A single specimen was acquired at Turrialba (K.U.M.N.H. No. 31946). The specimen is a light cream or fawn color with a series of approximately 32 discrete transverse separated brownish blotches, which tend to fork laterally; below each of these is a small darker spot, rarely enclosing a tiny white spot, usually separated from, but may be contiguous with, the dorsal blotch. On tail the spots can be discerned for some distance, then they become obsolete. The head is black.

A well-defined pair of internasals are present, lying rather diagonally, pointed on the outer end, and widened mesially. In the prefrontal area there are approximately 46 scales present, with a median depression anterior to the frontal. The latter scale is bordered by three somewhat enlarged scales anteriorly and is bilobed at its front end, the lobes partially separated. Two small supra-

oculars, separated from frontal by two rows of small scales, lie above the eye. The parietals are large, separated from the frontal by two or three rows of small scales, and from each other, anteriorly by four rows, posteriorly by one or two rows of small irregular scales. There are two somewhat enlarged postparietals touching the parietals. The nasal is large and at least partially divided. In the loreal region there are several somewhat enlarged scales. A total of about 17 scales encircle the eye, and represent the supra-, pre-, sub-, and postoculars. The labials are separated from these by two rows of small scales; there are twelve supralabials, and 13-14 infralabials. The scales about the back of head number 33, about neck and anterior part of body 26, about middle of body 28, on the latter fourth 26, in front of tail 24. The ventrals are 153, anal single, the subcaudals 88, of which the first is undivided. The maxillary teeth are 21, the two at the end of the series somewhat enlarged. The characters in which this specimen seems to differ from the type of *N. torresi,* are a differently shaped nasal scale, very differently shaped internasal scales; the absence of an enlarged supraocular and the presence of 28 instead of 26 rows of scales at midbody.

The ventral and subcaudal counts in the type and this specimen are, ventrals 149 and 153; subcaudals 71 and 88. Totals 220 and 241.

The general character of the body scales and the smoothness of the anterior head scales is similar to those of *torresi.*

Until a series of these strange snakes can be assembled from a single area it will be impossible to determine whether we are dealing with a highly variable species, or whether these represent two separable populations.

I am tentatively associating this specimen with *Nothopsis torresi.*

Scaphiodontophis venustissimus (Günther)

Fig. 2

Henicognathus venustissimus Günther, Biologia Centrali-Americana; Reptilia and Batrachia, Oct. 1894, p. 144, pl. 51, fig. C (type locality, Matagalpa, Hda. Rosa de Jerico [3,250 ft.], Nicaragua).

Scaphiodontophis venustissimus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 35-36 (incorrectly attributes the name *Hemicognathus* to Günther [*error typ.*]).

Two specimens, K.U.M.N.H. No. 31932 from San Isidro del General, and No. 31933 from Tenorio, Las Cañas, Guanacaste, Costa Rica, are in the collection.

The first specimen is light, the dark marks in rather strong con-

trast to the lighter red coloration; each scale in the red areas has a discrete dark spot as well as small flecks of black and a fine peppering of dark pigment. The white areas joining the black bars are pigmentless. The venter has considerable pigment scattered on ventrals; a black spot on each subcaudal.

Scale data on this specimen is as follows: ventrals, 136; anal divided; 50 + subcaudals. Maxillary teeth, 51; supralabials, 9-9, the

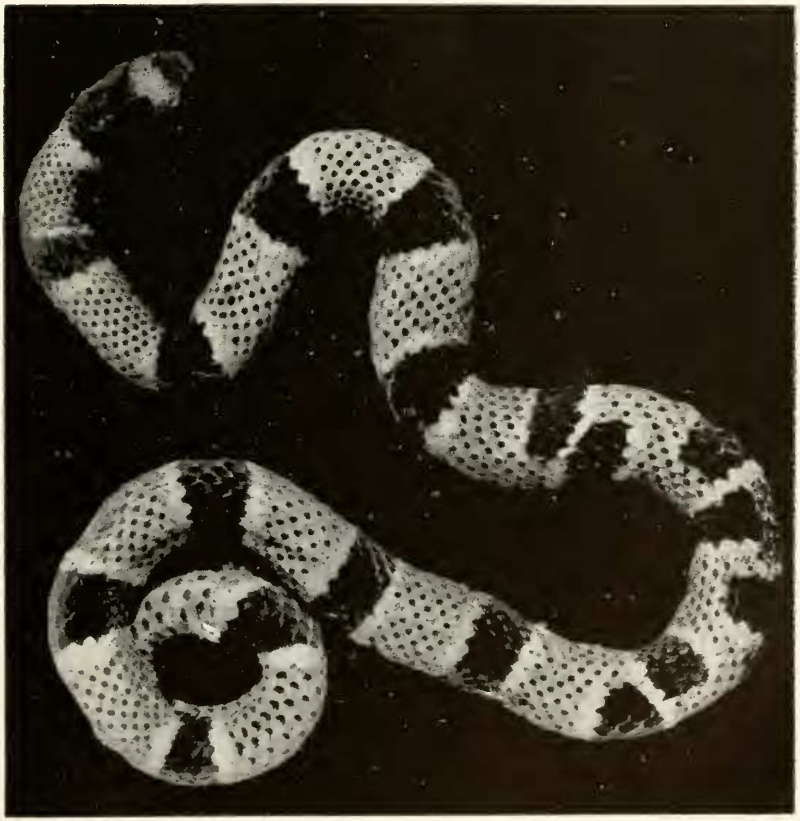

FIG. 2. *Scaphiodontophis venustissimus* (Günther). K.U.M.N.H. No. 31932; San Isidro del General, San José Prov., Costa Rica. (About natural size.)

fourth, fifth, and sixth entering eye; infralabials, 11-?, four touching the first chinshields; one preocular; two postoculars. Scale rows smooth, 17-17-17, without pits. The tail has been broken and repaired with a long terminal spike and would appear to be complete. Temporals, 2 + 3.

The second specimen, No. 31933, has the red areas very dark so that the red in life is scarcely discernible, the yellow parts bordering the black bands are likewise heavily peppered with pigment but discernible. The venter is ivory with scattered flecks of bluish black. Tail spotted below.

Scale data: ventrals, 135; anal divided; subcaudals, 107. Scale rows, 17,17,17, without pits; temporals, 1+2+2; supralabials, 9-9, three entering orbit; infralabials, 9-9, four touching chinshields.

No. 31935, discovered under a rock, was caught by the tail, which broke off while the snake was suspended; a second time it was picked up and with little effort the snake freed itself again by breaking off another portion of the tail. A third time the experiment was tried and a third section was severed.

I have not observed this behavior in other species but suspect that as in the case of geckoes this habit may have survival value, since individuals of other species of *Scaphiodontophis* often show mutilated tails. I am not aware that autotomy has been reported in other species or genera of snakes.

On another occasion at the Esquinas Forest Preserve, a young specimen of the species was observed entering a hole. It was seized by the tail and this broke off easily allowing the snake to escape below the root of a forest tree.

Geophis godmani Boulenger

Geophis godmani Boulenger, Catalogue of the Snakes in the British Museum, vol. 2, 1894, p. 322, pl. 16, fig. 4 (type locality, Irazú, Costa Rica).

I obtained a specimen of this diminutive species, 2 miles northeast of Pacayas, Cartago Province, in August, 1951. The specimen, K.U.M.N.H. No. 30957, was taken under a rock on the edge of a small bit of forest.

It agrees with the type in most essential characters. The rostral is somewhat shorter, and the part visible above is approximately one half the distance from the rostral to the frontal. The frontal is slightly broader than long, its length slightly less than its distance from the tip of the snout, and very much shorter than the parietals; the loreal enters the orbit. A minute postocular is present but there is no supraocular or preocular. There are six supralabials in the following order of size: 2,1,6,4,3,5, the third and fourth entering the orbit. The mental is rather pointed at tip and three infralabials touch the first pair of chinshields, which are a trifle larger than the second pair and are not in contact. The following characters are also present: six infralabials; scales in 15 smooth rows; three scales between ventrals and chinshields; 136 ventrals; 27 subcaudals; anal

single. Most of the rostral, internasals, first labial and sixth supralabial, cream. The venter is cream-white except for a little dark pigment on widely scattered ventral scales, while under the tail there is much such pigment with a few cream scales. The remainder of the body is black. The length of the specimen is 156 mm., the tail, 18 mm.

This species seemingly remains very rare in collections.

Geophis hoffmanni (Peters)

Colobognathus Hoffmanni Peters, Monatsb. Akad. Wiss. Berlin, 1859, p. 276, pl., fig. 2-2c (type locality, "Costa Rica").

Specimens of this diminutive species were obtained at Bataan (K.U.M.N.H. No. 30928), Turrialba (30929), San José (31987), Cartago (25737), Pacayas (30930), Tenorio (31986), and San Isidro del General (25736, 31985).

No. 30928 is a very small eastern lowland specimen with a broad light band across head and neck over which some pigment is scattered. It likewise has the smallest ventral count (119) (subcaudals 31) and the smallest total ventral-subcaudal count (150). This is approached by that of a specimen from Tenorio, which has 121 ventrals and only 29 subcaudals, but likewise with a total of 150 scales.

Specimens from higher elevations usually have a somewhat higher total, sometimes reaching as high as 164 scales. The second pair of chinshields may be separated in the series. The scales of all are smooth save on the sides near the vent but the keels are very weak in younger females. The specimen from Tenorio has more dark pigment on the venter than any of the other specimens listed above.

Scale data on *Geophis hoffmanni* (Peters)

Number K.U.M.N.H.	*Age or Sex*	*Ventrals*	*Subcaudals*	*Totals*
30928	yg ♂	119	31	150
30929	♂	120	33	153
25737	♂	129	35	164
31987	♂	131	29	160
30930	♂	127	34	161
31986	♂	121	29	150
25736	♂	129	23 +	152 +
31985	♀	132	30	162

Geophis dolichocephalus (Cope)

Colobognathus dolichocephalus Cope, Proc. Acad. Nat. Sci. Philadelphia, Oct. 24, 1871, p. 211 (type locality, San José, Costa Rica).
Geophis dolichocephala Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 43-44, pl. 3, fig. 2.

A specimen referred to this species was taken at Moravia de Chirripo (K.U.M.N.H. No. 31988). It differs in color pattern from

Taylor's figure, (*loc. cit.*) in having the red spots obsolete on the neck, and somewhat more numerous on the sides (approximately 25) many of them tending to become contiguous posteriorly.

In the character of the scales of the body, that is, the strong striation and keeling of body scales over much of the body and in having the outer row keeled in the region of the vent, this specimen is typical.

The scales on the neck and anterior part of the body have a tiny tubercle or incipient keel at the base of the scales. There is no evidence of apical pits. The head is narrow and elongate, the frontal, probably abnormally, showing a median ridge.

Geophis moestus Günther

Geophis moestus Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 9, 1872, p. 15 (type locality, Cartago, Costa Rica); Biologia Centrali-Americana. Reptilia and Batrachia, May 1893, pp. 90-91, pl. 33, fig. C. (*part.*); Amula, Mexico, and Cartago, Costa Rica. [The specimen from Mexico may be referable to another species.]).

Geophis moesta Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 44 and 46.

A series of specimens from the southern slopes of the Cordillera Central are referred to this species. I also have two specimens from Santa Cruz, southeastern slope of Volcán Turrialba, and one from the southern slope of Volcán Barba, previously reported.

Specimens from the western part of the range are large and robust. The largest, a female, measures 405 mm., total length; tail 60. The tail length in total length varies from 6.1 to 6.8 times in large females. Variation is indicated in the following table. Nos. 30926, 30927, 31991, 6783 are from Pacayas; 31990, 31981 from Cot; 31993, 31994, 31995 from Capilla del Monte La Cruz.

Data and scale counts on *Geophis moestus* Günther

Number	30926	30927	31990	31991	31981	31993	31994	31995	6783
Sex	♀	♀				♀	♀		
Ventrals	136	139	141	138	138	140	146	146	140½
Subcaudals	31	33	32	41	36	35	33	37	32
Supralabials	6–6	6–6	6–6	6–6	6–6	5*–6	6–6	6–6	5–5
Infralabials	6–6	6–6	6–6	6–6	6–6	7–7	7–7	7–7	6–6
Labials enter orbit	3,4	3,4	3,4	3,4	3,4	3,4	3,4	3,4	3**
Labials touch chinshields	3–3	3–3	3–3	3–3	3–3	4–4	4–4	4–4	3–3

Geophis brachycephalus (Cope)

Colobognathus brachycephalus Cope, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 211 (type locality, Costa Rica).

Geophis brachycephala Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 46-48, pl. 4, figs. 2, 3; text fig. 1.

A series of three specimens are in the collection, two, K.U.M.N.H.

* 5 and 6 fused
** 3 and 4 fused

Nos. 30923, 30924, are from Cervantes and 31989 from 6.5 km. SW Cartago.

The keels are absent from scale rows three and four except in the general region of the vent. None bear pits. Scales in the posterior part of the body and on tail are striated.

The following table (including two specimens previously studied) shows the general characteristics.

Data and scale counts on *Geophis brachycephalus*

Number	840	25735	30923	30924	31989
Museum	R.C.T.	K.U.M.N.H.	K.U.M.N.H.	K.U.M.N.H.	K.U.M.N.H.
Sex	♀	♀	♀	♂	♀
Locality	Santa Cruz	Santa Cruz	Cervantes	Cervantes	near Cartago
Total length	245	230	303	273	181
Tail length	35	24	50	53	28
Body length	210	206	253	220	153
Tail in total length	7	6.4	6.05	5.15	6.4
Ventrals	140	143	139	136	137
Subcaudals	34	35	36	41	37
Anal	1	1	1	1	1
Supralabials	6–6	6–6	6–6	6–6	6–6
Infralabials	6–6	6–6	6–6	6–7	7–7
Labials in orbit	3&4	3&4	3&4	3&4	3&4
Labials touch first chinshields	3–3	3–3	3–3	3–4	4–4
Second chinshields divided	no	no	yes	yes	yes

Geophis bakeri * sp. nov.

Type: K.U.M.N.H. No. 31983, collected July 19, 1952, Cinchona, Isla Bonita (formerly American Cinchona Plantation) Costa Rica, by Edward H. Taylor.

Paratypes: K.U.M.N.H. Nos. 31982, 31984, Isla Bonita, July 19 and 22, 1953, and No. 30940, Pacayas, Cartago, August 6, 1951. Edward H. Taylor, collector.

Diagnosis: A medium sized *Geophis* lacking anterior temporals, preoculars, but with supraoculars, postoculars and internasals present and the first labials in contact behind mental; "pits" present on scales on anterior part of body situated laterally some distance back from tip. Part of rostral visible from above a little more than one third its distance from frontal.

Description of type: Medium large *Geophis* the length of the head (11 mm.) very much greater than width (6.8 mm.); rostral wider than high, the part visible above very bluntly angulate behind, equal to a little more than one third its distance from frontal; a pair of prefrontals wider than long, their suture shorter than visible part of rostral, seen from above, forming nearly equal sutures with the two nasals; prefrontals large, extending much behind their common suture, entering orbit, bordered laterally by loreal and posterior nasal; frontal slightly wider than long, four sided; supraocular

* This species is named for Mr. John Baker, who accompanied the author on the expedition of 1952.

small, touching prefrontal, frontal, and parietal; parietals elongate their length equal to their distance from tip of snout; a small postocular touching the supraocular; no preocular or anterior temporal.

Anterior nasal smaller than posterior; nostril pierced chiefly in the anterior nasal, which touches first labial; second nasal touching two anterior labials; loreal elongate, its length twice its greatest width, third and fourth labials border eye, fifth much the largest, broadly in contact with parietal; one secondary temporal between sixth labial and parietal; the ascending order of size in labials is 1,2,3,4,6,5; six lower labials in the following order of size 2,1,3,6,5,4; first labials elongate transversely, forming a median suture equal to their width. Mental curving (not pointed) anteriorly; first pair of chinshields longer than broad, slightly longer but considerably broader than second pair, which are in contact anteriorly but separated through three fourths of their length by a median smaller scale and separated from first ventral by two median larger scales; scales on body smooth anteriorly, becoming minutely striate and keeled on the latter half of body; scales of anterior part of body and neck with strongly defined paired lateral pits ("apical" pits of authors) the pits situated one fourth to one third of the scale length back from tip; scale formula, 15-15-15; ventrals, 141; subcaudals, 32; anal single.

Color: Above, sides and top of head, entire back and side of body iridescent blue-black, the color extending as small points onto the edges of ventrals; chin and venter white, except for small lines of scattered pigment crossing the anterior part of the scales (but seemingly along their posterior edges), the amount of pigment increasing toward vent, and there covering nearly half of the scale; subcaudal region dark with a trace of a lighter area on each scale; anal scale uniform blackish; area on the anterior pair of chinshields dark; there is less pigmentation on the lower labials and other scales on chin.

Measurements and scale data on *Geophis bakeri*

			Type	
Number	30940	31982	31983	31984
Sex	♂	♀	♀	♀
Total length	355	315	333	191
Snout-vent length	295	265	282	163
Tail length	60	50	51	28
Head width	7.05	6.45	6.8	4.2
Head length	13	10.8	11	7.5
Ventrals	134	141	141	141
Subcaudals	39	35	33	36
Second chinshields separated	partly	partly	partly	no
First labials touch	yes	yes	yes	yes
Scale formula	15–15–15	15–15–15	15–15–15	15–15–15
Apical pits	yes	yes	yes	yes
Tubercles on chin	yes	no	no	no

Variation: The median dorsal ridge is indicated to a greater or lesser extent in all four specimens, although very indistinct in the shortest.

The three topotypic specimens have the apical pits clearly distinguished. A large specimen, No. 30940, taken at Pacayas at a comparable elevation, is a male. The amount of pitting is less and some of the anterior scales have a microscopic tubercle at base; the second lower labial is white. The five anterior lower labials, the chinshields, as well as some adjoining scales, have nuptial tubercles. No. 31982, a female, has less ventral pigmentation than the type taken at the same time and place.

Remarks: The presence of the scale pits has not to my knowledge, been reported in a typical *Geophis* previously and it might be well to re-examine members now recognized as belonging to the genus. Usually the character has been regarded as having a generic significance.

Geophis acutirostris sp. nov.

Fig. 3

Type: K.U.M.N.H. No. 34670. Collected, Cot (Cartago Prov.) approx. 5,500 ft. elev. southern slope of Volcán Irazú; July 2, 1952, Edward H. Taylor, collector.

Diagnosis: A small *Geophis* with internasals absent, probably fused together with anterior nasals, which are narrowly separated mesially by contact of rostral with prefrontal; part of rostral visible above very nearly equal to one half its distance from frontal; supraocular and postocular fused into a single scale curving down behind eye; five supralabials, six infralabials; scales in 15 rows, glassy smooth except for a trace of keels on a few scales above vent.

Description of the type: Rostral higher than wide, the part visible above triangular, pointed behind, touching the prefrontals and separating the anterior nasals; prefrontals very large, rhomboidal, entering orbit for a distance equal to or larger than that of loreal, the median suture parallel with the outer side of scale, the sutures with the nasals parallel with the frontal border; frontal slightly wider than long, quadrangular; suture between parietals less than length of frontal, but total length of scale is slightly greater than its distance from rostral; posterior nasal scales forming straight sutures with labials, prefrontals, and loreals; anterior and posterior nasals separate; loreal very large, its length nearly two and one-half times its width, entering eye; no preocular; no anterior temporal; five upper labials, their sutures usually straight lines, the third and fourth

entering eye; fifth labial very much enlarged, touching the combined post- and supraocular at one point; mental rounded rather than pointed anteriorly; six lower labials the first pair transverse forming a broad median suture; first chinshields longer than broad touching three infralabials; second pair of chinshields equally as long, but narrower, in contact by a short suture, with a scale lying between their posterior parts; two other single scales lie between this and first widened ventral.

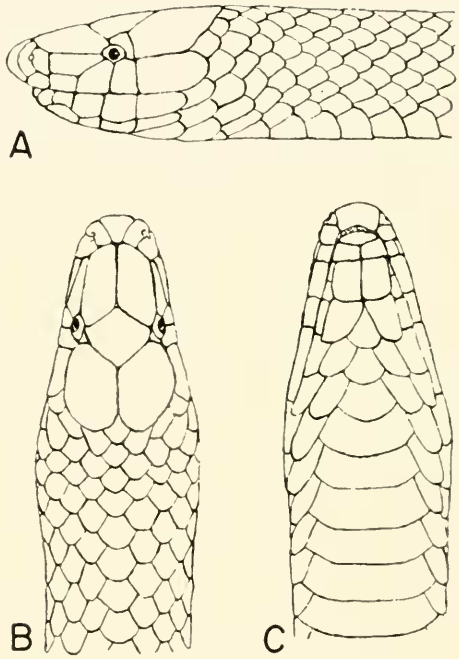

FIG. 3. *Geophis acutirostris* sp. nov. Type. K.U.M.N.H. No. 34670; Cot, Cartago Prov., Costa Rica. (× 5.)

Scales smooth except for a trace of keeling and striation on sides above vent; scale formula, 15-15-15. The ventrals are 130; subcaudals 29; anal single.

Color: Above somewhat iridescent bluish-black, the top of head lighter bluish-black; chin, lower labial, and anterior part of venter cream white, but posteriorly pigment encroaches on the ends of the ventrals; the subcaudal region is much more heavily covered with brownish pigment, the scales with slightly less pigmented centers.

Measurements in mm.: Total length, 237; tail 33; width of head, 4.9; length of head, to the back of jaw, 9.

Remarks: Geophis cancellatus, from Chiapas, Mexico, has the

internasals absent. It, however, differs in having six supralabials, 171 ventrals, subcaudals 21-23, and numerous crossbands on body. While the size and ventral subcaudal count is similar to *hoffmanni*, the numerous differences in squamation of the head amply separate them.

The head as figured is somewhat narrower than in life, due to preservation.

Geophis zeledoni sp. nov.

Fig. 4

Type: K.U.M.N.H. No. 31992, Finca Zeledón, between Volcán Barba and Volcán Poás (elev. *circa* 6000 ft.), July 24, 1952, Edward H. Taylor collector.

Paratype: No. 31951, same data as type.

Diagnosis: A rather large *Geophis* with a short head; six (five) upper labials, six lower labials; mental large, pointed posteriorly; first labials in contact or mental separating first labials; supraocular and postocular present; loreal not twice as long as high; scales lacking striations, without apical pits, smooth except that keels are present before and behind level of vent; venter brownish black.

Description of type: Rostral small, its width at base about equal to the height of the scale; part of rostral visible above a little more than one third of the distance from frontal, the scale very obtusely angulate behind; internasals small, transversely elongate; prefrontals large, entering eye, the common suture about three fifths of the length of the scales; frontal nearly as long as wide, its length equals its distance to tip of snout, quadrangular, bluntly angulate anteriorly, somewhat more pointed posteriorly; parietal length less than its distance from tip of snout, separated from eye (entering orbit between the supraocular and the diminutive postocular in paratype).

Anterior nasal smaller than posterior; loreal length less than twice its width, entering eye; no preocular; no primary temporal; one secondary temporal above the fifth labial, longer than high; five supralabials, in the following ascending order of size: 1, 2, 4, 3, 6, 5, the third and fourth entering eye. (In paratype third and fourth fused together.) Diameter of eye about equal to its distance from mouth; length of fourth labial only a trifle greater than its height.

Scales smooth, lacking apical pits and striation; the scale formula, 15-15-15; ventrals 146; subcaudals 40; anal undivided. The outermost row of scales a little the largest over most of the body.

Measurements in mm. of type and paratype: Total length, 397, 359; snout to vent, 327, 296; tail, 70, 63; width of head, 8, 8; length

of head, 14, 11; head length to end of parietal, 10.8, 10; tail in total length, 5.67 times, 5.54 times.

Color: Above strongly iridescent lavender brown or lavender black, the head grayish to gray-brown, with a somewhat darker brown area on parietals; chin scales brownish with lighter edges

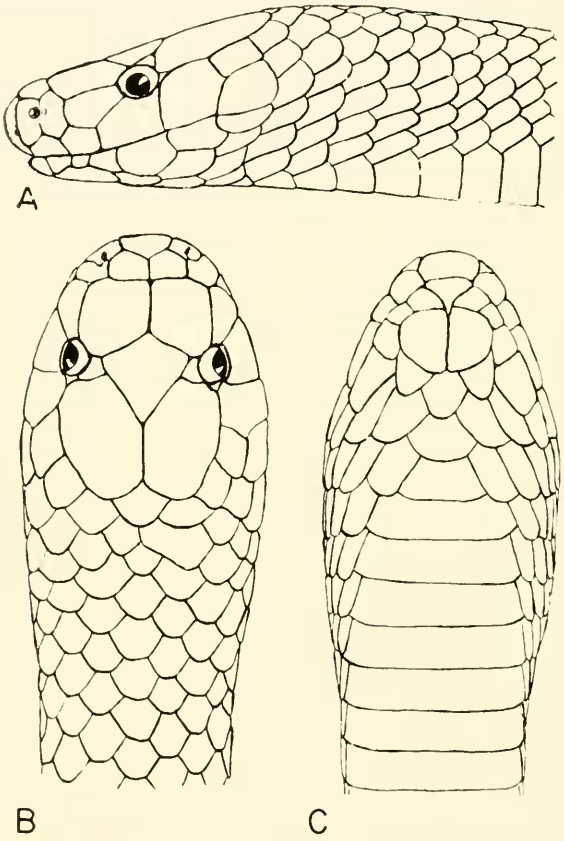

FIG. 4. *Geophis zeledoni* sp. nov. Type, K.U.M.N.H. No. 31992; between Volcán Barba and Volcán Poás, Costa Rica. (×5.)

and a blacker area on first chinshield. Venter lavender brown with a few lighter flecks.

The paratype agrees in the characteristic coloring of dorsum and venter but the mental does not separate the front labials, the third and fourth labials are not fused, and the postocular is narrow and elongate separating the parietal from orbit. The glassy smooth scales without striations are characteristic of this species.

The dorsals are keeled on the latter sixth of body, near level of vent.

The ventral count is 145½, the subcaudals count 42. The head seemingly is a little broader proportionally and somewhat ultramarine in color. Both holotype and paratype were taken in the same patch of woodland between 5,000 and 6,000 ft. elevation.

The fusion of the third and fourth labials occurs also in a specimen of *moestus;* the reduction of the supralabials in *G. hoffmanni* is due to the reduction posterior to eye, perhaps a fusion of the fifth and sixth. The separation of the first labials by the mental is an unusual variation in Costa Rica *Geophis.*

The species is named for Sr. Don José Zeledón a distinguished Costa Rican scientist who collected and studied Costa Rican reptiles more than 75 years ago.

Ninia sebae sebae (Duméril, Bibron and Duméril)

Streptophorus sebae Duméril, Bibron, Duméril. Erpétologie Générale . . . vol. 7, pt. 1, 1854, pp. 515-517 (type locality, restricted to Veracruz, Veracruz, Mexico by Smith and Taylor).

Ninia sebae sebae Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 50.

This species is represented in the collection by the numbers, K.U.M.N.H. 31902-31905 from La Lola, Limón Province, at which place it seems to occur rather commonly, according to report.

The specimens agree in having the top of the head black followed by a narrow lighter band. This in turn is followed by a broad nuchal spot reaching on the sides to the first scale row, and extending four to five scale-lengths, this followed by a narrow lighter line. The greater part of the upper and lower labials are without dark pigment except the tip of the chin and the outer edges of the chinshields. There are no other dorsal spots present, the body being dull uniform brownish red, or the red may not be well defined.

The scale formula is, 19-19-19; the ventral-subcaudal counts are given for Nos. 31902-05 respectively: ♀ 138, 58; ♂ 132, 66; ♀ 140, 51 +; ♂ 131, 65.

The youngest specimen, No. 31905, was reddish above, in life, with two yellow bands, one preceding and one following the black nuchal blotch. The venter was pale pinkish, the chin being gray white.

The specimens were found under rotting logs.

Duméril, Bibron, and Duméril give "Mexico" as the type locality for this form, and this has been restricted to Veracruz, Veracruz by Smith and Taylor. The Costa Rican specimens compared with Mexican specimens from lowland Veracruz show certain differences.

The former lack the body bars or spots, and the pigmentation is scattered heavily over the scales, not confined so much to the scale edges. There is even less pigmentation on the edges of the ventrals.

The ventral-subcaudal counts, in the material at hand, compared with counts on 59 specimens from southern Veracruz and four from Chiapas are as follows:

Costa Rica females average	139-58
Chiapas females average	149-45
Veracruz females average	142-47
Costa Rica males average	131-65
Chiapas males average	140-56
Veracruz males average	138-55

In the Veracruz series the range in females is: ventrals 138 to 146; subcaudals 45 to 53; in males, ventrals range from 132 to 145; subcaudals 51 to 62.

From this sample it would appear that Costa Rican specimens have shorter bodies and longer tails than the average of the northern populations. Larger sampling will be necessary to ascertain whether these differences are taxonomically significant.

Ninia atrata (Hallowell)

Fig. 4a

Coluber atratus Hallowell, Proc. Acad. Nat. Sci. Philadelphia, 1854, p. 245 (type locality, Colombia [Venezuela] less than 200 miles from Caracas).
Ninia atrata Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 50-51.

One female specimen of this species (K.U.M.N.H. No. 31971) was taken at Cinchona (Isla Bonita), July 19, 1952.

The characteristics of this species follows: rostral broader than high, visible above as a line; internasals a little wider than long, their length equal to slightly less than half of the prefrontals; latter scales a little broader than long, a little less than length of frontal, entering orbit; frontal triangular in shape, as broad as long, with a small entrant suture in front (possibly abnormal); parietals slender, elongate, their length approximately that of the distance between parietal and rostral; nasal at least partly divided, the anterior part slightly the larger, the posterior part somewhat depressed; a small scute notched into the ventral part of nasal (probably segmented from first labial with which it forms a suture); loreal large, its length one and a half times its height, entering orbit; two postoculars, the lower very small, the upper much enlarged; no preocular; temporals 1+2+3; supralabials 7-7, the third and fourth entering orbit, the fifth barely excluded; infralabials 8-8, the first four bordering the

first chinshield; first labials in contact; first pair of chinshields wider and longer than second pair; two labials touch second pair.

Scale formula: 19-19-19, all the rows of scales strongly striated and even the keels with striae; ventrals, 125, subcaudals, 38, the anal single.

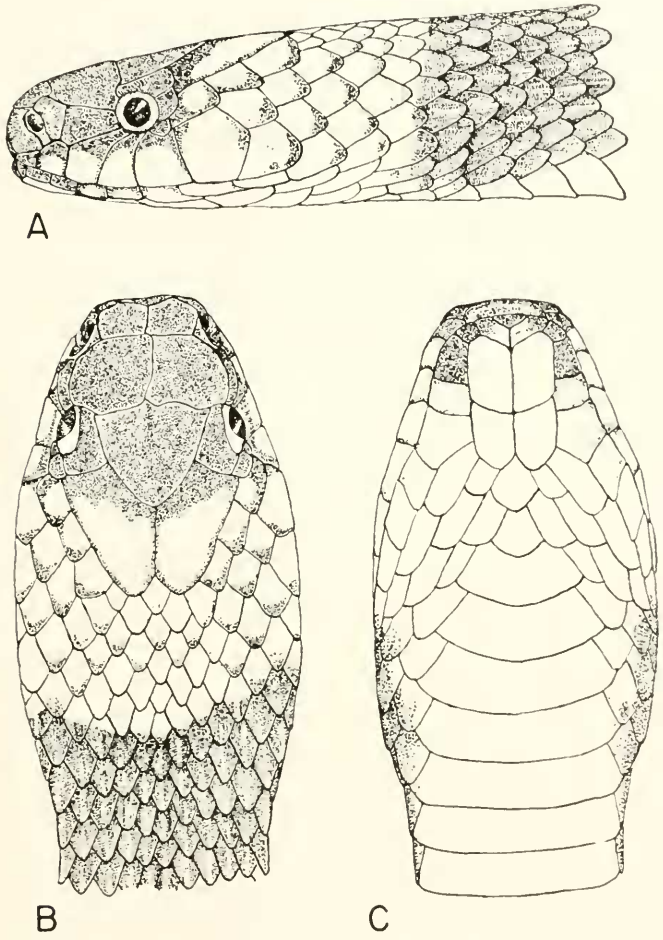

FIG. 4a. *Ninia atrata* (Hallowell). K.U.M.N.H. No. 31971; Cinchona, Costa Rica. (× 5.)

Color in life: Deep black above with a broad bright red-orange occipitonuchal band covering posterior part of parietals, temporals, and four and a half transverse scale rows; each scale of this band with either a dark spot or scattered pigment. Anterior part of head black with some white spots on four labials; area about jaw angle

yellow; venter greenish white, slightly pinkish laterally on sides bordering the black; anterior infralabials and the mental with dark marks; flesh white on chinshields, dull yellow elsewhere on chin and below the red-orange band. Subcaudals bluish white, outlined in black, becoming more pronounced posteriorly.

Remarks: The outer parts of the ventrals are strongly striated.

The specimen was taken on the lower part of Cinchona (Isla Bonita) at an elevation of about 4,500 feet.

Ninia maculata (Peters)

Streptophorus maculata Peters, Monatsb. Akad. Wiss. Berlin, 1861, p. 924 (type locality, Costa Rica).
Ninia maculata Dunn,* Proc. Nat. Acad. Sci., vol. 21, no. 1, Jan. 1935, pp. 10-11 (*part.*).

A number of specimens are in the collection from the following localities. K.U.M.N.H. Nos. 31908, 10 mi. WSW San Isidro del General; No. 31909, 7 mi. S Cartago; No. 31912, Finca Quirazú, 4 mi. SW Cartago; No. 31911, Tres Rios; Nos. 31906, 31907, 31910, 31915, 34841-34844, Turrialba.

The eastern lowland species *Ninia tessellata* also occurs at Turrialba and Moravia de Chirripo, each maintaining its distinctive color pattern.

Ninia tessellata Cope

Ninia sebae tessellatus Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8, 1876 (1875), p. 145 (type locality, Sipurio, Costa Rica, by inference).
Ninia atrata tessellata Cope, U. S. Nat. Mus. Bull. 32, 1887, p. 74.
Ninia tessellata Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 53-54.

A small series of *Ninia tessellata* are in the collection from the following localities: K.U.M.N.H. No. 31929, Cinchona 30935, Morehouse Finca near Turrialba; 30936, Turrialba; 30937, Bataan; 30926, 30928, 30931-30934, Los Diamantes, 2 mi. S Guápiles; 31921-31922, Limón; 31923-25, 31927, La Lola.

I had regarded this form as being lowland but specimens taken at Turrialba, approximately 2,000 feet and Cinchona at approximately 4,500 ft. show that it has a considerable vertical distribution. Two eastern lowland specimens have a small preocular, probably severed from a labial. Another has an upper preocular on each side severed from the section of the prefrontal that enters orbit.

* Dunn's statement "In Costa Rica *maculata* seems concentrated on the Atlantic-Caribbean slope and *sebae* on the Pacific," may be misleading. *Maculata* occurs on the Pacific slope at San Isidro del General and is absent in the coastal areas of the eastern slope; *Sebae* is common at La Lola in the Caribbean drainage.

In life, specimens are lavender brown to brown with black zigzag transverse bands; below checkered black and flesh or ivory white.

The range of *Ninia tessellata* approaches but probably does not reach as high an elevation as *Ninia oxynota*. Specimens have been taken within a few miles of each other but with a difference of at least 1,500 in elevation. It occurs with *atrata* at Cinchona, and with *sebae* in the eastern lowlands; with *maculata* at Turrialba and perhaps at even higher elevation in the Meseta Central. However, in the region about Cervantes where *maculata* is very common I have not found *tessellata* but *oxynota* occurs within a few miles at perhaps 500 ft. higher elevation.

Ninia oxynota (Werner)

Streptophorus oxynotus Werner, Mitt. Naturh. Mus. Hamburg, Jahrg. 26, 1909 (1910), p. 216, (type locality, Cariblanco, Costa Rica).
Ninia oxynota Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 56-58, pl. 6, fig. 2-3.

Two specimens (K.U.M.N.H. Nos. 30956, 31972), were taken at Pacayas, Cartago Province, Costa Rica. The specimens agree well in color pattern with the specimen figured by Taylor (*loc. cit.*). The following scale characters obtain in No. 31972: supralabials, 7-6, the fourth and fifth or third and fourth entering orbit; two postoculars; loreal large, quadrangular; temporals, 1 + 1 (1 + 2); scale rows, 17, 17, 17; ventrals, 159; subcaudals, 70; anal single. Scales very finely striate; outer scale row keeled except on neck.

No. 30956 ♀. The temporals are 1 + 2; there is a somewhat enlarged scale behind parietals (present in all specimens seen). The ventrals are 158, the subcaudals 77.

In this form there are 10 maxillary teeth diminishing somewhat in size posteriorly. The series extends forward to a point near suture between the second and third labials.

Ninia cerroensis sp. nov.

Fig. 5, 6

Type: K.U.M.N.H. No. 31935 ♂; collected on the Pacific slope of Cerro de la Muerte, at an elevation of approximately 7,500 feet (on Pan American Highway) by Edward H. Taylor.

Diagnosis: A species related to *N. psephota* Cope, but differing in having the outer scale row keeled and lacking the black dorsal coloration and red ventral coloration.

A very narrow nuchal yellow band, scarcely 1 scale-length wide,

interrupted mesially; 17 scale rows throughout, the tips with a small transparent lobe or extension; supralabials and infralabials, 6; nasal divided; 14 maxillary teeth, slightly larger near middle of series.

Description of type: Rostral a half wider than high, its upper surface rounded, not angulate; internasals much wider than long, their length somewhat more than a third of the prefrontal length;

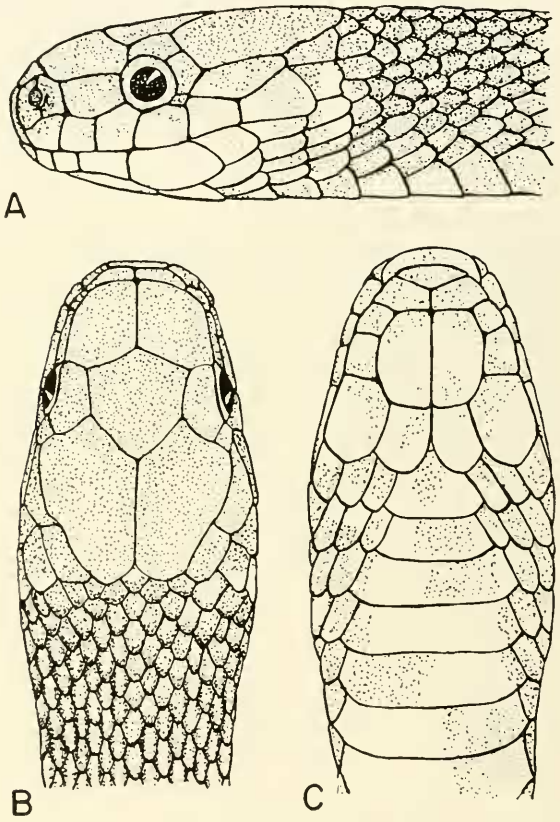

FIG. 5. *Ninia cerroensis* sp. nov. Type. K.U.M.N.H. No. 31935; Pacific slope of Cerro de la Muerte, Costa Rica. (×5).

prefrontals distinctly longer than wide, the width equal to length of their common suture entering orbit; frontal hexagonal, the width equalling length which is less than that of prefrontals; supraoculars longer than wide, their width less than half that of frontal; parietals elongate, their length equalling their distance from tip of snout; nasal divided, the anterior about equal to posterior; the posterior part touching two labials; loreal large, nearly rectangular, its length

a fifth greater than its height; postoculars, 1-2, elongate, somewhat curving (on the left side there is a very small lower postocular); temporals, 1 + 2, the anterior large, elongate; the two posterior lie almost behind the last supralabials; six upper labials in the following order of size: 1, 2, 3, 4, 5, 6, the last much enlarged, the third and fourth entering orbit; eye moderate, its diameter less than distance to nostril; six infralabials, the first pair in contact, the first three touching first chinshields, the fourth much enlarged, touching

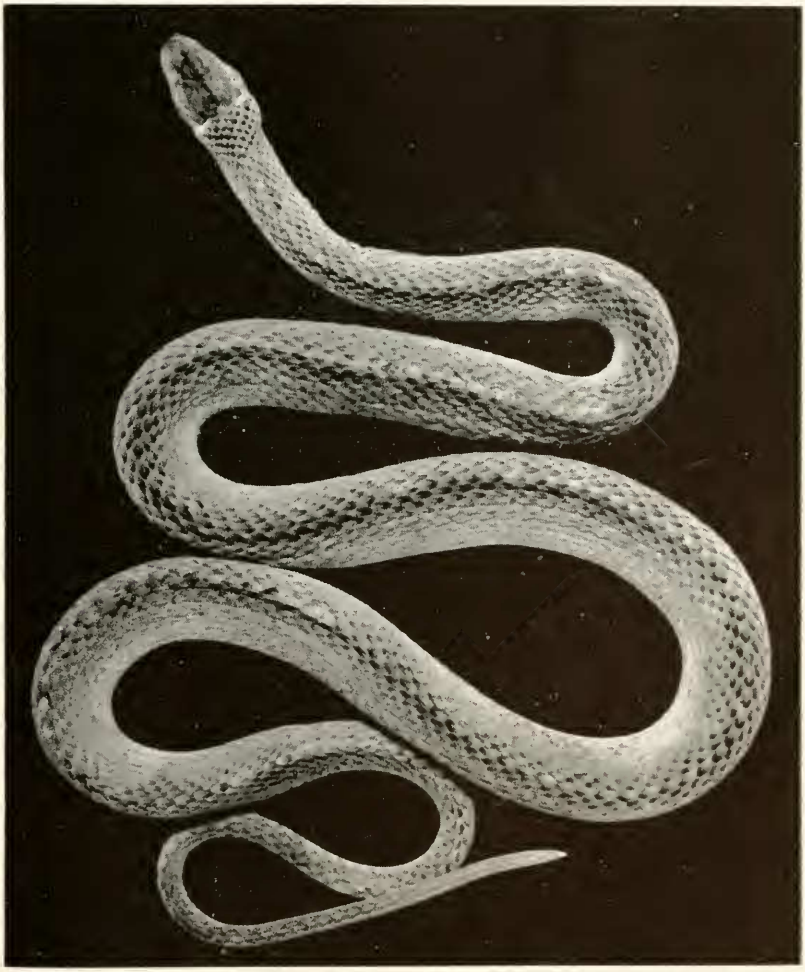

FIG. 6. *Ninia cerroensis* sp. nov. Type K.U.M.N.H. No. 31935; Pacific slope of Cerro de la Muerte, Costa Rica. (Somewhat enlarged; actual length 494 mm.).

second chinshields. First chinshields a third longer but scarcely wider than second pair, which are in contact; scales immediately following are wide, similar to ventrals; scale rows on back of head, 19; on body, 17, 17, 17; all scales keeled but without striation or apical pits; ventrals, 160½, (counting from second chinshields); subcaudals, 60; anal single.

Color in life: Above nearly ultramarine on body, the color extending onto ventrals a varying distance; a narrow yellow nuchal collar interrupted mesially by the parietal tips; color of top and sides of head gray-blue, each of the supralabials showing a cream spot; a small indistinct light spot on temporal and outer edge of parietal; infralabials and chinshields with cream spots, the six most prominent being a pair on first chinshields, and four in a row on fourth labials and second chinshields; the areas on ventrals not covered with body color are yellow cream; underside of tail slate gray, with some suggestion of lighter centers anteriorly, and posteriorly, the edges have a suggestion of darker borders. There are no cream spots as occurs in *oxynota.*

Measurements in mm.: Total length 494; tail 123; width of head 8.5; length of head 14.

Remarks: The species has the body somewhat triangular in cross-section. When the epidermis is removed the color is the same; but if the surface of the scale is abraised or scraped, the color below is deep black.

The ventral markings seem very haphazard, compared with *oxynota* where the white or dark color of the venter either crosses the ventral completely or is severed on the median line leaving the scale half light, half dark. The series of yellowish transverse bands on the body in *oxynota* are completely lacking in this form.

Ninia psephota has the color of the dorsum black and of the venter black and red. The outer scale row is smooth, the others keeled. The following characters of *cerroensis* also differ from the type of *psephota.* The maxillary teeth do not extend as far forward; frontal angular, rather than convex on anterior border; the nasal divided rather than single; the temporals larger, lacking tertiary temporals. There are no spots on the subcandal region.

The type of *psephota* is from 5,000 to 7,000 feet elevation on Pico Blanco (Caribbean drainage); *cerroensis* seemingly replaces it at similar elevation in the Pacific drainage of the Talamanca range.

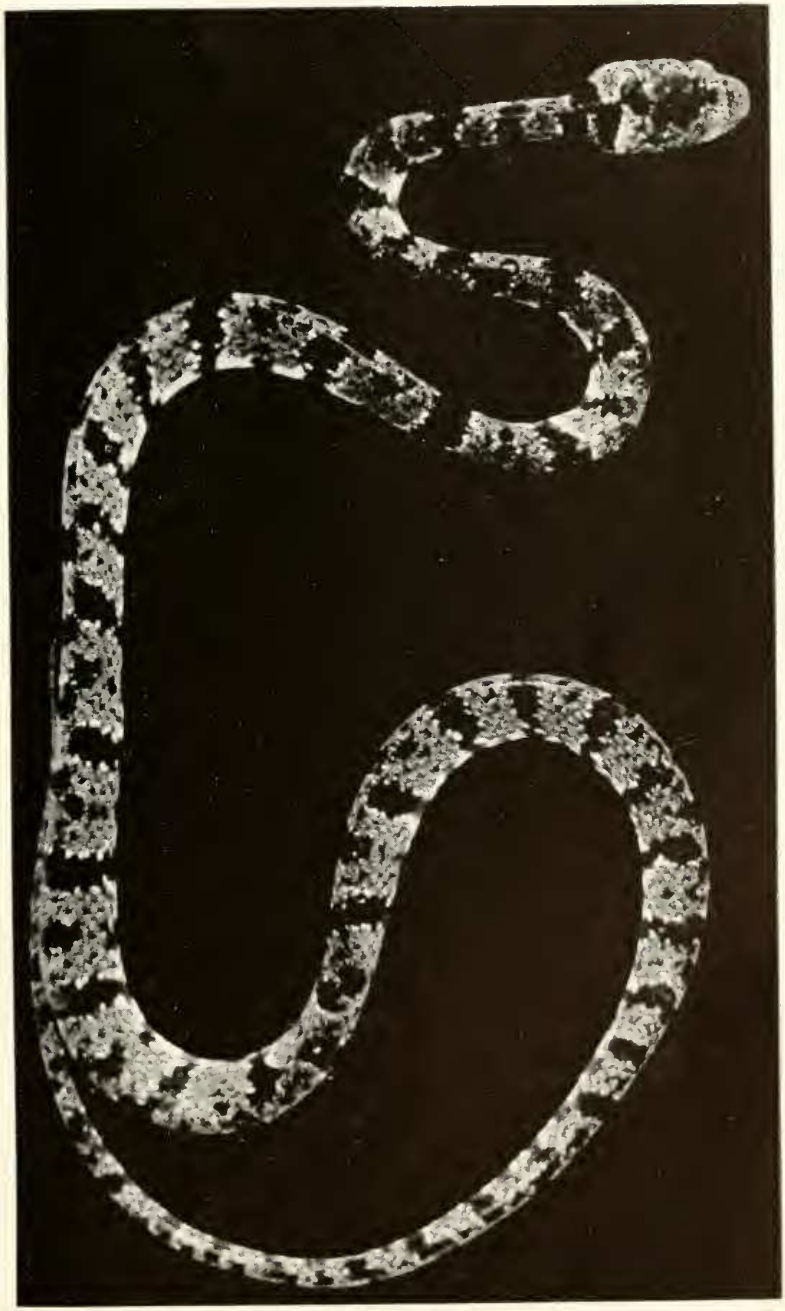

FIG. 7. *Sibon nebulatus* (Linnaeus). K.U.M.N.H. No. 31936; Los Diamantes, near Guápiles, Limón Prov., Costa Rica. (Somewhat enlarged).

Sibon nebulatus (Linnaeus)

Fig. 7

Coluber nebulatus Linnaeus, Systema Naturae ed. 10, vol. 1, 1758, p. 222 (type locality "Africa" in error. Restricted to Jicaltepec, Veracruz by Smith and Taylor.)

Dipsas nebulatus Dunn, Copeia 1947, no. 3, pp. 157; Ecology, vol. 30, 1949, pp. 39-57.

Sibon nebulatus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 67-68.

Two specimens were taken, K.U.M.N.H. No. 31936, July 26, 1951, Los Diamantes, near Guápiles, Costa Rica, and No. 31937, at the Inter-American Institute of Agriculture, Turrialba, June 2, 1951.

This snake, with a range from Mexico to Brasil, seemingly does not diversify, into subspecific forms, the characters remaining rather constant.

Significant characters not mentioned by me (*loc. cit.*) are the much enlarged median scale row, the narrow neck, and compressed body. Many snakes with laterally compressed bodies are arboreal. The specimens I have found were on the ground, and none in trees, although it is probably arboreal. A third specimen, taken at Tenorio by John Baker, escaped from a faulty collecting bag.

These specimens agree with the characters offered (Taylor *loc. cit.*) save that the nasals are seemingly not completely divided. Supralabials, 7-7, the fourth and fifth entering orbit; infralabials, 8-8, the first four touching the first pair of chinshields in one, by five in the other (No. 31937). In this specimen the second chinshields are absent, the one on the right is fused to the anterior, the one on the left seemingly is fused to the third; No. 31936 has three pairs of chinshields. The latter specimen has: 178½ ventrals; anal single; 100 subcaudals; the former 188 ventrals; anal single; 100 subcaudals. The spotting and general coloration differs but little in the two specimens.

Xenodon bertholdi Jan

Xenodon Bertholdi Jan, Arch. per la Zool., 1863 pp. 318-319 (type locality "Mexico"). Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 69.

Two specimens Nos. 31963 from Turrialba, No. 31979 from Estrella (Limón Province). The ventral-subcaudal counts are respectively 150-45, and 148½-44. The character of the pattern of the larger specimen is shown in the illustration.

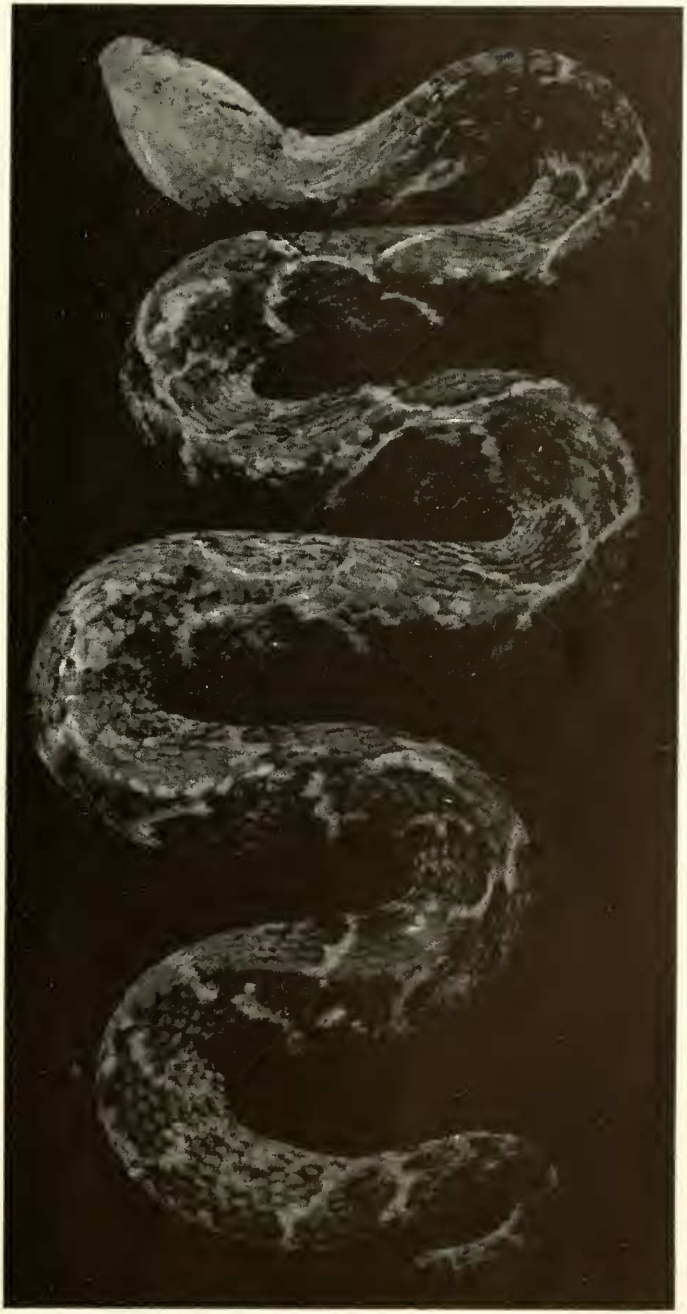

FIG. 8. *Xenodon bertholdi* Jan. K.U.M.N.H. No. 31979; Estrella, Limón Prov., Costa Rica.

Xenodon colubrinus Günther

Xenodon colubrinus Günther, Catalogue of the colubrine snakes in the collection of the British Museum, 1858, pp. 55-56 (type locality, Pará).
Xenodon colubrinus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, Oct. 1, 1951, pp. 69-70.

The material of this genus in Costa Rica seemingly resolves into two species, *Xenodon bertholdi* Jan, and *Xenodon colubrinus* Günther. The latter appears to break up into an eastern and western group having the following characters:

K.U.M.N.H. Nos. 30922 and 31980 from Turrialba. In these specimens there is a blackish mark that takes its beginning on the frontal but, not covering the whole of it, sends out two slight projections onto the supraoculars, widening as it moves backwards until it covers the dorsal surface of the neck. It passes back onto the neck for an inch and surrounds two lighter stripes about an inch long. The black median part has a narrow entrant gray line in No. 30922 but this cannot be discerned in No. 31980. The venter and subcaudal region are light with some clouding barely indicated. The dorsal blotches are 11 and 13, none broken on the median line of body. Ventrals and subcaudals are respectively: 147—44; 147—45. Both are females.

The other, western, group is well represented by four specimens, Nos. 31964 ♀, 31966 ♂, San Isidro del General; No. 31965 ♀, Tenorio, and No. 34839 ♀, Golfito. The heads in these are light olive tan with minute black flecks or dots forming a more or less symmetrical design. The first (nuchal) spot does not connect with a head spot. It encloses one or two gray ocelli on the midline. The blotches are 11 to 13, none being divided mesially. The venters are heavily pigmented, the two smaller specimens having the pigment somewhat denser on the middle third of the ventrals. The Tenorio specimen has the venter equally gray but in another specimen (a large female from San Isidro del General), the venter is as light as in the eastern specimens but the head pattern conforms to that of the western specimens. In all, the subcaudal region is light. The ventral-subcaudal counts of the four specimens are: 151—48; 138—46; 146—48, and 148—46. Most of the specimens have four to eight pairs of the terminal subcaudals with convex surfaces and present, to a greater or lesser degree, in both sexes. The dentition in one specimen shows 15 smaller subequal teeth; and two large ungrooved fangs, the posterior edges of which are sharp.

The Tenorio specimen had eaten a *Bufo haematiticus*, which it disgorged in the collecting sac.

Enulius sclateri (Boulenger)

Leptocalamus sclateri Boulenger, Catalogue of the Snakes in the British Museum, ed. 2, vol. 2, 1894, p. 251, pl. 12, fig. 1 (type locality "South America"); and vol. 3, 1896, p. 641 (Guasima = Guásimo, Costa Rica).
Enulius sclateri Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 71-74, pl. 8, and text fig. 3.
Enulius slateri (*sic.*) Dunn, Ecology vol. 30, no. 1, Jan. 1949, pp. 51-53, 54, 55 (Mentions certain specimens taken in Panamá).

This small snake species was taken at two Costa Rican localities, K.U.M.N.H. No. 34047, San Isidro del General; Nos. 34048, 34049, Turrialba. There is some evidence of geographical variation in the ventral counts and there are certain obvious differences in coloration.

In squamation of the head, the three specimens do not differ markedly in any character save that No. 34047 has a distinctly wider and lower rostral, and the snout does not extend quite so far forward.

In my description *loc. cit.* I state that there are four pits in the anterior scales. A re-examination of this specimen shows that this statement is not true. The appearance of four is illusory. There are two "pits" which in certain light appear as two lighter dots and preceding these is a similar pair of dots. In the examination of the shed scale there is no evidence of the anterior pair. Held in certain lights the scale surface shows only two surface irregularities.

The pits are usually absent from the three outer scale rows. Many scales have only a single pit (on one side or the other) just before they reach the end of their distribution posteriorly.

One specimen from Turrialba is generally ultramarine in color with the dorsal scales finely peppered with very fine pigment more intense anteriorly, practically absent posteriorly; on the neck, the color reaches as low as the third scale row. The head and chin are cream-white extending behind parietals for three or four transverse scale rows. The tip of the snout, and area about the eye, dark, the color extending somewhat into the front edge of the frontal; there is a white spot indicated on the prefrontal in front of eye. The second specimen, somewhat larger, has been darkened by formalin preservative, but the character of the head markings is practically the same. In the specimen from the western slope of the Talamanca Mountains at San Isidro del General the head is black to the end of the frontal, the color covering the anterior ends

of the parietals, temporals, postoculars, the first three anterior labials, and parts of the fourth and fifth. The frontal is dark. The chin, instead of being immaculate, has the mental and parts of the first two infralabials dark. The remainder of the head is cream-white, the color extending behind parietals to the second transverse scale rows. A small black fleck is present on each side of neck on the white ground. The body dorsally is dark gray, somewhat darker anteriorly. The venter is cream white, the subcaudal region gray, each scale showing a somewhat lighter area.

Table of measurements and scale data of *Enulius sclateri*

	Length	*Tail*	*Ventrals*	*Subcaudals*
34047 ♂	362	152	129½	100
34048 ♂	504	188	150	96
34049 ♂	425	164	150	97
Type ♀	380	150	144	98
Guásimo ♂	.	.	132	?
Los Diamantes ♂	.	.	145	97

I collected the specimen from San Isidro del General in an old rotting stump, and the one from Turrialba in a similar habitat.

Hydromorphus concolor Peters

Hydromorphus concolor Peters, Monatsb. Akad. Wiss. Berlin, 1859, pp. 276-277 (type locality, Costa Rica); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 74-75. (San José, Costa Rica.)

I acquired a young male specimen (K.U.M.N.H. No. 31955) collected in the environs of San José. The head has been somewhat injured. It differs from the type, but agrees with a specimen reported by me (*loc. cit.*) from San José, in having the internasals fused into a single scale, separating the nasals. The exact provenance of the type specimen is unknown and if the character of the divided internasals is constant, the San José specimens may represent a population separable from that to which the type belongs. It is possible that the type is anomalous in this regard.

The characters present in the specimen before me are as follows: Scale formula (19,17),17,15; ventrals, 171; subcaudals, 41; anal and preanal divided; frontal as long as wide; supraoculars slender, curving down slightly at anterior end; loreal entering eye; no preocular; two postoculars; prefrontal large, single; parietals as long as their distance from tip of snout; first chinshields large, a little longer than broad; second pair less than half their size, separated by two median scales; the third pair of scales, likewise separated by two scales; supralabials, 6-6, the third entering eye; infralabials, 8-?, four touching the first chinshields; temporals, 1+2+3.

The color above is purplish slate, nearly uniform dorsally on head and body. The infralabials are dark. On the sides the outer scale rows are somewhat lighter, the first showing but little pigmentation, but on the neck they are nearly of the same color as venter. Below, the venter is light yellowish white with some dark pigmentation on the outer edges of the ventrals and a median series of indistinct flecks from neck to vent. The subcaudal region is uniformly dark. On one side the temporal is pointed anteriorly and seemingly enters the orbit at a single point.

A species of this genus, *Hydromorphus clarki*, has been described from Agua Clara, a village near the Chagres River, Panamá, presumably from a severed head, including some part of the neck (measurements, ventrals, and subcaudal counts not given). This is presumably distinguished from *Hydromorphus concolor* by having only one internasal and one postocular, instead of two of each, and the temporal borders the orbit; the 2½ outer scale rows have the same light color as the ventrals (on the part back of the head).

Dr. Emmet Reid Dunn, the describer, has examined a specimen of *Hydromorphus* from the U. S. National Museum from San José. This specimen also has only a single internasal but he regards it as conspecific with *concolor*. It does, however, have two postoculars instead of having one of them fused to the temporal. In my specimen from San José, the temporal on one side is sharply pointed seemingly entering the orbit at a point between the two postnasals.

I may have here a specimen of *Hydromorphus clarki* Dunn, and if so, the two species will have to be regarded as occurring together at San José since my specimen differs chiefly from the type specimen of *clarki* in having two instead of one free postocular, and in having a body and tail. One might even be justified in suspecting that *clarki* is a synonym of *concolor*.

Trimetopon pliolepis Cope

Trimetopon pliolepis Cope, Proc. Acad. Nat. Sci. Philadelphia, 1894, p. 201 (type locality, San José, Costa Rica, P. Biolley, collector); Cope, Trans. Amer. Philos. Soc., vol. 18, 1895, pl. 30, fig. 1 (hemipenes); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 76-77 (Costa Rican specimens).

This species has been placed by certain authors in the synonymy of *T. gracile* despite the obvious differences in the number of scale rows, *gracile* having 15, *pliolepis* having 17; in the type of *gracile* there are seven supralabials, the third and fourth bordering orbit, in the type of *pliolepis* there are eight supralabials the fourth and

fifth bordering the orbit. Four specimens are in the collection, two from Isla Bonita (K.U.M.N.H. No. 34036-37); two from Los Diamantes (Nos. 30955, 34038). The four specimens all have the scale formula, 17-17-17. All have eight supralabials, the fourth and fifth bordering orbit; all show typical lineation of indistinct dark and light stripes on body. Each infralabial has a black spot and the frontal has a pair of light spots.

While the color pattern, scale formula, and conformation of the head squamation is virtually the same in the known specimens, there is some considerable variation in the ventral-subcaudal count suggested. This varies in ventrals from 141 to 154; subcaudals from 59 to 76, with a variation in total count of from 200 to 230. The lowest counts are from the lowlands, the higher counts are from intermediate elevation, the middle counts from the highest localities. The totals 224-230 occur at San José, elev. 1,060 m.; 217, La Palma, 1,980 m.; 214-219, Isla Bonita, 1,520 m.; 200-206, Los Diamantes, app. 250 m. It is possible that much of the variation is sexual.

The following table gives data on the specimens in the collection.

Table of data on *Trimetopon pliolepis* Cope

Number	30955	34038	34036	34037
Locality	Los Diamantes	Los Diamantes	Isla Bonita	Isla Bonita
Sex	♀	♀	♂	♂
Ventrals	146	145	146	143
Subcaudals	36	61	73	71
Supralabials	8–8	8–8	8–8	8–8
Infralabials	8–8	8–8	8–8	8–8
Preocular	1–1	1–1	1–1	1–1
Postocular	1–1	1–1	1–1	1–1
Scale formula	17–17–17	17–17–17	17–17–17	17–17–17
Frontal light spots	present	present	present	present
Length total	210—tip broken	235	151	242
Tail length	.	60	42	69
Nuchal band divided	yes	yes	yes	yes

Trimetopon sleveni Dunn

Trimetopon sleveni Dunn, Proc. Acad. Nat. Sci. Philadelphia, vol. 92, 1940, pp. 117-118 (type locality "Near Boquete," Chiriquí Prov., Panamá, Alt. 4,000 ft.).

It is with some hesitancy that I associate with this species a snake, which I collected at Isla Bonita, Costa Rica, July 23, 1952, at an elevation of approximately 1,676 m.

The specimen agrees with this species in having a scale formula of 17-17-17, one preocular, two postoculars, seven supralabials, the third and fourth entering eye, seven or eight infralabials, the first three or four touching chinshields, paired prefrontals, paired inter-

nasals, and one loreal. There are paired light spots on the neck. No pits are discernible on the scales. The specimen shows no lateral keeling above the vent. The ventrals are 164, and 53 subcaudals; the anal is divided.

Above, the specimen is very dark but when submerged a median and two darker lateral lines are discernible with lighter lines between. The markings on the head agree with the type description except for some small whitish spots on the internasals. The chin is white but there is black spotting on the scales of the lower lip and chin, back as far as the eighth infralabial. The body and tail are reddish below.

One could scarcely expect greater conformity in specimens from widely separated localities. The head is rather short. The total ventral-subcaudal count is 217 ♂, while in the types and paratypes it is 213 ♂, 209-211 ♀. The maxillary teeth are 12, gradually increasing to the last but they are less robust than in *gracile*.

This is the first record of the species in Costa Rica.

Trimetopon gracile (Günther)

Ablabes gracilis Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 9, Jan. 1872, p. 18, pl. 3, fig. D. ("Elevated country near Cartago")
Trimetopon gracile Cope, Proc. Amer. Philos. Soc., vol. 22, 1884 (Mar. 7, 1885 *), p. 177; Taylor, Univ. Kansas Sci. Bull., vol. 34, pl. 1, no. 1, Oct. 1, 1951, pp. 79-80.

A single specimen taken near Empalme on the Pan-American Highway south of Cartago, Aug. 1951, by John Reark, and presented to me, agrees with Günther's type in essential characters.

Since Dunn and others have confused this species and *pliolepis*, I append a description of the specimen.

Scale formula, 15-15-15; head rather elongate; two internasals, one prefrontal; one preocular; one postocular; temporals, 1 + 1 + 2; seven supralabials, the third and fourth entering orbit; mental and first three infralabials with black spots; no frontal spots; two separated light spots on nape, diagonally placed, converging forward, separated by a median dark line; a line across temporal region to behind jaw angle. Some suggestion of lineation on body with a darker line on edge of ventrals and one on the third and fourth scale rows.

Ventrals, 153; anal divided; subcaudals 47 + (tip missing); total length 260 + mm.; tail 53 + mm.; head length 9.5 mm; width of head 5 mm.

* Date on the cover of separate, June 30, 1885. The genus is diagnosed, with *gracile* as the type. "Two internasals; one prefrontal plate. Two nasals; rostral not produced; a loreal, and one preocular. Scales smooth, with one pore. Anal divided."

This specimen in life had a yellow border on rostral, yellow spots on four anterior supralabials, and an elongate cream mark from eye across the fifth and sixth supralabials; head blackish anteriorly and brownish on prefrontals, frontals, and parietals; the cream color of chin pushes up over jaw angle; anterior part of venter cream-white, posterior part reddish; subcaudal area bluish white, with some scattered dark pigment.

The maxillary teeth are 12, gradually increasing in size to last; teeth, without a diastema.

Hypsiglena torquata torquata (Günther)

Fig. 9

Leptodeira torquata Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 5, Feb. 1860, pp. 169-171, pl. 10, fig A. (type locality, 2 cotypes, one from Nicaragua, the other from the Island of Laguna, Nicaragua (here restricted to the latter locality).

Hypsiglena torquata torquata Taylor, Univ. Kans. Sci. Bull. vol. 34, pt. 1, no. 1, Oct. 1, 1951 (Costa Rican records).

A specimen collected at San Isidro del General, San José Province, Costa Rica by Lic. Oldemar Chavarria Ch. was obtained by exchange. The specimen now K.U.M.N.H. No. 31930 is faded but the essential characters of the markings are present. The top of the head is tan in color; the outer rims of the parietals are white, which color forms a band of varying width on the neck, partially divided mesially by a short median line of tan, and terminating (mesially) seven scales behind the parietals. The ground color is fawn. A brown line begins behind the eye and continues to the angle of the mouth. There is a median series of somewhat rhomboidal brown spots which are, for the most part, contiguous, forming a distinct zigzag line of unequal thickness, broken at several points and leaving individual spots. There are about 49 spots on the body, and about 28 on the tail. The ventrals are 195½, the subcaudals 101. The anal is divided. There are small brown spots on sides, the lower row most distinct.

The following scale characters obtain: rostral narrowly visible above; internasals large their suture three fifths of length of prefrontal suture; frontal shield-shaped much longer than its distance to tip of snout; supralabials eight, the fourth and fifth enter orbit; infralabials 10-10; two preoculars the upper very large, vertical, touching frontal; temporals, 1+2+3; two postoculars upper largest; second pair of chinshields larger than the first, which touch five

infralabials; posterior nasal much larger than anterior; eye large, somewhat less than length of snout. The total length is 247 mm.; the tail 64 mm.

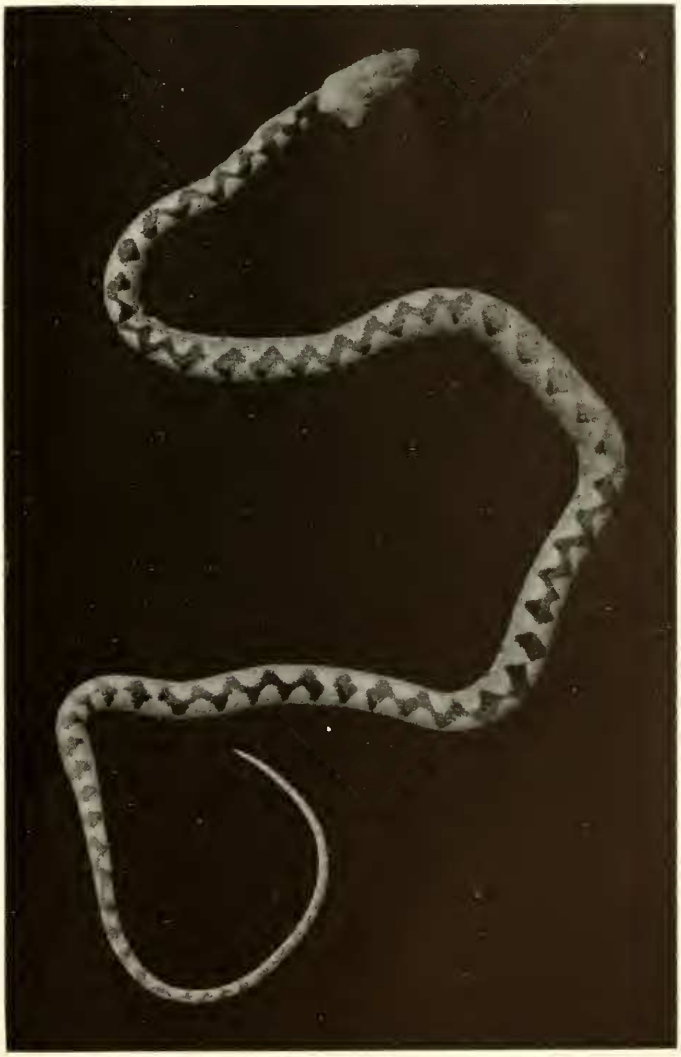

Fig. 9. *Hypsiglena torquata torquata* (Günther). K.U.M.N.H. No. 31930; San Isidro del General, San José Prov., Costa Rica. (Actual total length, 247 mm.).

Amastridium veliferum Cope

Amastridium veliferum Cope, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 370 (type locality, Cocuyas de Veraguas, New Granada = Cocuyas, Panamá); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 81-82.

Two specimens of a small snake, one K.U.M.N.H. No. 31913 from Isla Bonita and No. 31914 from Turrialba, Costa Rica, are referred to Cope's species *Amastridium veliferum*. This snake is relatively rare in collections and little is known of its habits and habitat. One erroneous statement in the literature is that the species has no apical pits.* Pits are, however, present on scales of the anterior part of the body. The pits are situated not far from the tip of the scale. The specimen from Isla Bonita is from an elevation of a little less than 5,000 ft. It was discovered crawling into a pile of trash in a cultivated area near a forest.

The general characters of squamation differ but little in the two specimens. No. 31913 has the parietal shorter than its distance from the tip of the snout, while No. 31914 has the parietals longer than this distance. Both are males and the scales above the vent on sides are strongly keeled for a distance of an inch or an inch and a half, but dorsally the two or three median rows are keeled for five inches, the keeled scales extending both anterior and posterior to the level of the vent. The maxillary teeth are 11 or 12 followed after an interval by two much enlarged teeth. The pupil is round. The large scale entering the orbit anteriorly is regarded as a preocular rather than as a loreal. In No. 31913 the nasal has a suture from the nostril to the upper edge of scale. This scale in No. 31914 lacks the suture. In this latter specimen the rostral is a little larger, bending on the upper surface of the snout a somewhat greater distance leaving a broadly triangular area instead of a line. (Seen from above, the snout is rather sharply truncate.) Whether these differences are of nomenclatorial significance can be determined only with series of specimens. The difference in elevation between localities where these specimens were taken, is more than 310 m. The localities are approximately 70 km. apart, separated by a chain of volcanoes.

No. 31913 ♂ has the head very distinctly brownish, in strong contrast to body color. The dorsal body color is blackish but when

* Dr. Emmet Reid Dunn, who reviewed this species (Proc. U. S. Nat. Mus., vol. 65, 1925), states that *veliferum* has pitless scales. This is untrue as pits are present in the species. A second species, *Mimomctopon sapperi*, which Dunn refers to this genus is said to have pitless scales. I have not had occasion to examine the species but if pits are absent and the fang is grooved it might be well to reconsider the generic status of Werner's *Mimomctopon sapperi*.

submerged with strong light, four darker lines running the length of the body can be seen. The venter is brownish black with an indistinct darker transverse line on each ventral. Minute yellow dots occur along the fifth row of scales.

In No. 31914, the darker lines are much more evident, the two median ones joining anteriorly on neck, become more or less broken into a series of blackish dots on back, the median area between them being darker than that between the outer dark lines. In these lighter areas the scales have lighter centers and darker borders. The anterior part of the venter is more grayish, the outer portion of each ventral being observably lighter in color. Other variations are shown in the following table.

Measurements in mm. and data on *Amastridium veliferum*

Number	31913	31914
Sex	♂	♂
Total length	366.3	334
Snout-vent	252	227
Tail	114.3	107
Head to jaw	12	12
Head to end of parietal	10	9.8
Head width	6.8	6.2
Ventrals	129–2	126–2
Subcaudals	77	80
Anal	2	2
Apical pits	yes	yes
Temporals	$1\ \frac{1}{1-2}$	$1-1-2$ or $1-\frac{1}{1-2}$
Supralabials	7–7	7–7
Infralabials	9–9	9–9
Preocular	1–1	1–1
Loreal	0–0	0–0
Postoculars	2–2	2–2
Scale formula	(21–19) 17–17–17	(21–19) 17–17–17

Spilotes pullatus pullatus (Linnaeus)

Coluber pullatus Linnaeus, Syst. Naturae, ed. X, vol. 1, 1758, p. 225; Linnaeus, Museum Adolphi Friderici Regis, 1754, p. 35, pl. 20, fig. 3, (type locality, "Asia," in error, actually unknown).

Spilotes pullatus pullatus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 82-83.

Two specimens of this large snake are in the collection, K.U.M.N.H. No. 34882, from Turrialba, and No. 31970 from between Esparta and Palmares. The ventral and subcaudal counts of these specimens are: 225, anal single, 124; ventrals 218, anal single, subcaudals 124.

The head is generally yellow, with a dark line on most of the prefrontal borders and on the posterior borders of the internasals. A

wider, irregular, transverse band crosses the head along the sutures of the parietals with the frontals and supraoculars. A broader irregular band extends across the back of the parietals, across the suture between the seventh and eighth labials, and onto the chin. There are black marks on the sutures of the upper and lower labials, as well as on the other scales of the chin. On the dorsum there are eight or nine yellow spots which may connect with the yellow color on the venter. The anterior ventrals are yellow and black, the yellow predominating anteriorly but gradually becoming darker, posteriorly, the yellow not extending beyond ventral no. 117. Except on the neck, the scales are strongly keeled, each with paired pits, the pits on scales extending throughout the body and tail.

The younger specimen has the keels less distinct and the yellow spots on the back are more diffuse. The frontal is much longer than wide. The infralabials are 9-9, five touching the first chinshields. The yellow color ceases at ventral no. 121.

Leptophis * *mexicanus mexicanus* Duméril, Bibron and Duméril

Fig. 10

Leptophis mexicanus Duméril, Bibron, and Duméril, Erpétologie Générale . . . vol. 7, pt. 1, 1854, pp. 536-537; *Thalerophis m. mexicanus* Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 84-85.

A specimen K.U.M.N.H. No. 31947 ♂ was captured at the mouth of the Río Barranca, (Hotel Maribella), Puntarenas Prov., Costa Rica. The specimen agrees with data in Taylor (*loc. cit.*) for the most part.

The rostral is visible as a small triangle, seen from above, and the frontal one-third longer than broad, slightly longer than its distance from end of snout. The first temporal is twice as long as wide. The temporal formula is 1 + 2, preoculars, 1-2 (broken on right side). The second pair of chinshields is much longer than first, and the scales are touched by five infralabials. The length of the eye is equal to its distance from nostril. The formula for body scales is 15, 15, 11, all of the scales keeled save those on outer row, and most of those on the anterior part of the body have a single well-defined apical pit. The ventrals are 158, subcaudals, 155, the anal divided. The ventrals are laterally angular with an indefinite broken lighter streak along the keels.

In life the specimen was bronze-brown above with a black lateral

* In a recent publication Mr. J. Savage has re-examined the evidence for using *Leptophis* for this group of arboreal snakes. He concludes that this name must replace *Thalerophis* proposed for the group by Dr. James A. Oliver, Bull. Amer. Mus. Nat. Hist., vol. 92, art. 4, 1948, pp. 167-172.

stripe, bordered below by an ivory line covering outer scale row and a part of the second row. The venter is ivory, becoming bronze-ivory posteriorly.

FIG. 10. *Leptophis mexicanus mexicanus* Duméril, Bibron, and Duméril. K.U.M.N.H. No. 31947; Mouth of Río Barranca, Puntarenas Prov., Costa Rica. (Actual total length, 988 mm.)

The specimen was discovered in a small tree near the seashore by John Baker. With considerable difficulty, the two of us chased the snake from one part of the tree to another and finally it was jerked to the ground with a long pole of bamboo, and captured.

Leptophis nebulosus Oliver

Leptophis nebulosus Oliver, Occ. Papers Mus. Zool. Univ. Michigan, no. 462, 1942, p. 12, fig. 4. (Type locality, Cariblanco, Costa Rica.)
Thalerophis nebulosus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 85-86.

A young specimen from Golfito, Costa Rica, K.U.M.N.H. No. 34835, seems to be the second specimen of this species reported from Costa Rica, the first being the type from Cariblanco. Oliver reports a specimen from Patuca, Honduras, and three specimens from Nicaragua, with two definite localities (Greytown and Matagalpa). The specimen at hand extends the range to southwestern Costa Rica.

The specimen agrees rather well with the type description. The following characters are present:

The loreal is absent; preocular touching frontal; prefrontals longer than internasals; frontal nearly a half longer than its distance from tip of snout, as long as parietals; temporals, 1+2; supralabials, 8-8; infralabials, 10-11, five or six touching first chinshields which are smaller than second pair; second pair of chinshields separated; ventrals, 162; subcaudals, 179; ventrals angular; a light lateral stripe on outerpart of ventrals and on first and part of second scale row; chin and throat white; a dark stripe from eye across jaw angle and onto side for a short distance.

The specimen was collected by Mrs. Albert E. Weyer.

Leptophis ahaetulla occidentalis (Günther)

Ahaetulla occidentalis Günther, Proc. Zool. Soc. London, 1859, p. 412 (type locality, Guayaquil and western Ecuador).
Thalerophis richardi occidentalis Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 86.

Four Costa Rican specimens of this species have been acquired: K.U.M.N.H. Nos. 30996, 34044, Turrialba; No. 34043, Cariblanco, and No. 31958, Golfito. Two of these were taken on the ground in forested areas; two were on plants overhanging flowing water.

The variations in scale data are indicated in the following table:

Data on *Leptophis ahaetulla occidentalis*

	Sex	*Ventrals*	*Anal*	*Subcaudals*	*Supra-labials*	*Infra-labials*
30996	♂	166	1*	159	9–9	10–10
31958	♂	165	2	169	8–8	10–10
34043	♀	152	2	157	8–8	9–9
34044	♂	155	2	140–	8–8	9–9

* Anal single.

Anteriorly on the neck the keels on the scales of the female are absent, then they suddenly appear on the five median rows about three inches from the head; then at five inches back from head all except first outer row is keeled, the second being rather faintly keeled throughout.

In males the keels begin behind parietals and are heavier than in the female.

Leptophis ahaetulla praestans (Cope)

Thrasops praestans Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 20, 1868, p. 309 (type locality, Petén, Guatemala).

Leptophis praestans Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8 1876 (1875), p. 133 (Sipurio, Costa Rica); U. S. Nat. Mus. Bull., 32, 1887, p. 69 (east Costa Rica, Gabb. coll.; Guatemala, Hague coll.).

Thalerophis richardi praestans Oliver, Bull. Amer. Mus. Nat. Hist., vol. 92, 1948, pp. 248-250.

In the recent revision of the genus *Thalerophis*, Oliver has not accounted for the reference of Cope to a specimen of this species in Costa Rica and it is possible that it has been overlooked. I have recently taken a specimen of this large tree snake at Tenorio, Las Cañas, Guanacaste (K.U.M.N.H. No. 34902). A second specimen, No. 34898 from Turrialba, was obtained by exchange with Mr. Kenneth Olson. A brief description is appended of the former specimen.

The part of rostral visible above equal to about one third of the length of internasals, the width a little greater than height; internasals much shorter than prefrontals; frontal length equal to its distance from tip of the snout, slightly shorter than parietals that are approximately as wide as long, their length equal to their distance to middle of prefrontal; nasal elongate, divided; no loreal, the prefrontal touching second, third, and fourth labials; preocular large, widely separated from frontal; two postoculars; temporals, 1+2; eye length distinctly less than distance from nostril; supralabials, 9-9, the fifth and sixth entering the orbit; infralabials, 10-11, five or six touching the first pair of chinshields which are shorter than the second (separated) pair; suture between the first labials is half as long as that between first chinshields. Scale row formula 13-13-11-11; scales, except outer row, keeled, the second row dimly keeled and the median very slightly keeled on the anterior part of the body, the keels absent on posterior part of body; two rows on each side of the median row most strongly keeled, the keels black, thus forming two narrow black lines on each side.

In life the entire body and head above and on sides is yellow green, the belly uniformly yellow; chin greenish white.

Ventrals, 169; anal divided; subcaudals, 165+ (extreme tip missing). Total length, 1925 mm.; tail 730 mm.

The specimen was taken while riding along a forest trail. The specimen was lying motionless in the dead branches of a fallen tree. I approached on horseback. Just as I was about to seize it, it whirled its head and started away, at which time I struck it with my quirt. In color it was a brilliant yellow green, in strong contrast to the immediate surroundings where the specimen was discovered.

Leptophis aeruginosus Cope

Leptophis aeruginosus Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8, 1876 (1875), pp. 132-133.
Thalerophis depressirostris Oliver, Bull. Amer. Mus. Natural History, vol. 92, art. 4, 1948, pp. 203-206, (*part.*).

In his revision of the genus *Thalerophis* Oliver refers Cope's *Leptophis aeruginosus* to the synonymy of *T. depressirostris*, an action in which I concurred, after an examination of the type. The type specimen is a juvenile and now in a poor state of preservation. However, I have captured a specimen of this genus agreeing with Cope's description, at Tunnel Camp, near Peralta, Costa Rica, that convinces me that the species is distinct from *L. depressirostris* as well as from the form *T. saturatus*, which Oliver likewise has synonymized with *depressirostris*.

Description of species: K.U.M.N.H. No. 31962. Rostral much broader than high, the part visible above about one third of the length of internasals; latter scales longer than prefrontals, and distinctly longer than wide; frontal one-fifth longer than its distance from the end of the snout, somewhat bell-shaped, its greatest width equals two thirds of its length; parietals a little longer than wide, shorter than frontal; nasal divided, the anterior part longer; loreal short, its length less than one and one-half times its height; one preocular reaching upper head surface but separated from frontal; two postoculars, only the lower touching the anterior temporal; anterior temporal more than twice as long as wide, the lower secondary temporal fused to the anterior temporal. The row of scales bordering parietals and temporals subequal and regularly placed side by side; supralabials, 7-6, the fourth (or third) enters eye, infralabials, 8-8, five touching the first chinshields; second pair of chinshields one and one-half times first pair. Scale rows, 15, 15,

13, 13, lacking keels, but finely striated; apical pit on tip of scales anteriorly, the pit light in color; the diagonal arrangement of transverse lines of scales not strongly pronounced; ventrals, 148, last divided; anal divided; subcaudals, 139; total scales, 287.

Color: Rather golden brown to bronzy olive above with the median series of scales and inner edges of second row grayish yellow (whitish with epidermis removed); below bluish with a slight yellowish tinge anteriorly; chin cream-white; a black band from eye to jaw angle; most of rostral almost pure white; upper labials, except upper edges, bluish white. The bluish color of venter covers the first scale row also.

Remarks: The type of *aeruginosus* seemingly differs from *"saturatus"* in having a quadrangular loreal, a series of specialized scales behind parietals, a median light line, the absence of keels on the body, and seemingly, somewhat different proportions in head scales.

My specimen differs from the type in having the second and third supralabials, and the fifth and sixth, fused on each side, and on the left side the second, third, and fourth are fused; the last two or three infralabials are fused to form an elongate scale.

The type has 146 ventrals and 142 subcaudals, a total of 288.

Dryadophis melanolomus alternatus (Bocourt)

Coryphodon alternatus Bocourt, Bull. Soc. Philom., ser. 7, vol. 8, 1884, pp. 133-142; Mission Scientifique au Mexique et dans l'Amérique Centrale; Études sur les Reptiles, livr. 11, 1888, pl. 45, figs. 3a-e.
Dryadophis melanolomus alternatus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 87-88.

A diminutive specimen, K.U.M.N.H. No. 31959, which I collected at Tenorio, Guanacaste, gives satisfactory evidence that the name *alternatus* applies to this from and is aptly named, for the specimen agrees with Bocourt's figure (*loc. cit.*) in which the quadrangular dorsal blotch alternates with a lateral quadrangular series, the blotches separated by narrow lighter marks of dirty ivory. Top of head brownish black, the edges of the head scales light tan; labials gray ivory, each labial with black spot; a very narrow light line behind parietal; large dark nuchal spot nearly divided mesially; infralabials and scales of chin gray-black, each scale with an ivory spot; the anterior ventrals with paired spots.

Besides this young specimen six adults were taken. In all the scale formula is 17, 17, 15, 15; anal divided. Two specimens examined have 23 maxillary teeth. In general all agree with the con-

formation of head scales indicated by Bocourt. They are listed in the following table of data.

Data on *Dryadophis melanolomus alternatus*

Number	*Sex*	*Locality*	*Ventrals*	*Sub-caudals*	*Supra-labials*	*Infra-labials*	*Temporals*
30988	♀	Bataan	185	95+	9–9	10–10	2+2
30992	♂	Turrialba	176	97	9–9	9–10	$\frac{2}{1}$+2
31968	♂	Unknown	176	95	9–9	10–10	2+2
30991	♂	Turrialba	172	103	9–9	10–10	2+(2)+2
30989	♀	Cervantes	188	101	9–10	10–10	2+2
30990	♀	Cervantes	177	99	9–9	10–10	2+2
31959	juv.	Tenorio	187	104	9–9	10–10	2+2

Dryadophis sanguiventris sp. nov.

Type: K.U.M.N.H. No. 31978 ♀ ; collected, Esquinas Forest Reserve, Las Esquinas, (between Palmar and Golfito), Puntarenas Province, Costa Rica, Sept. 3, 1952 by Edward H. Taylor.

Paratypes: R.C.T. Nos. 1437, 1438, Los Diamantes near Guápiles, elevation 245 meters. Richard C. Taylor collector.

Diagnosis: A member of the *alternatus* group of the genus with dorsal coloration occupying outer, turned up, one fifth of ventrals; remaining part of ventral surface of body red to magenta or nearly orange red; ventrals somewhat angulate. Labials largely red; no distinct dark line on side of head; chin mottled gray and pink.

Description of type: Rostral broader than high, narrowly visible from above; internasals two thirds as long as prefrontals, which are much wider than long, forming an acute angle laterally; rostral longer than wide, its length equal to its distance from tip of snout, shorter than parietals, whose length equals their distance from the suture between prefrontal and internasal; parietals angular posteriorly; nasal divided; loreal slender, elongate, twice as long as high; one preocular reaching upper surface of head but separated from frontal; two small postoculars; temporals, 2+2+2—2+$\frac{2}{1}$; supralabials, 9-9, the fourth, fifth, and sixth entering orbit; infralabials, 11-12, six touching first chinshields, which are nearly a half shorter than second pair; scale formula, 17, 17, 15, 15; scales smooth with apical pits; ventrals, 183, subcaudals, 93, anal divided. Maxillary teeth, 20.

Color: In life, olive above, the color extending over body and tail and covering upturned ends of ventrals on each side; a gray lateral

stripe on part of the fourth and fifth lateral scale rows, growing obsolete on posterior fourth of body, bordered above and below by slightly darker borders; a wider gray stripe beginning on the neck continues to near base of tail, likewise bordered by darker edges, the intervening rows between gray stripes form an olive stripe fading out posteriorly. Head brown olive, the supralabials with olive shading, above with reddish spots. Infralabials, chin, and throat with numerous pink areas outlined by brownish gray. Remainder of venter red to magenta, but fading to ivory on the under side of tail.

In preservation the red and pink has faded leaving the venter immaculate cream-white.

Measurement of type in mm.: Length, total, 1070; tail length, 288; tail length in total length, 3.71.

Variation: Ventral and subcaudal counts of the male paratypes (R.C.T. 1437, 1438) are respectively 180, 182; 96, 97; No. 1437 has a single anal plate (anomalous). The color in life is actually more red than pink but the red fades quickly in preservative to a pink before it finally disappears, leaving the color cream, then later nearly white.

Remarks: Stuart* who studied this genus considered the Costa Rican material of this genus available to him as belonging to *Dryadophis melanolomus alternatus.* He lists 16 specimens from Costa Rica and gives the following specific localities Boruca, Gúapiles, Irazú, Monte Redondo, Navarro, San José, and Talamanca. Since he does not mention the red-bellied form I presume that his material did not contain this form, or if so the red having faded in preservative, he did not recognize it.

Following Stuart the two paratypes specimens were first placed in the subspecies *melanolomis alternatus* despite obvious differences. The venter is without scattered pigment and there is no indication of a zigzag line under the tail. The scales have lost their outer epidermis and the lateral grayish stripes can be discerned only with difficulty. Stuart has noted what he designates incipient speciation in *alternatus*, and at first recognized a form in Panamá. The form described here is presumably not Stuart's *melanolomus gaigei.*

The presence of the presumed typical form of *alternatus* on both the Caribbean and Pacific Coasts as well as in the central plateau

* Occ. Papers Mus. Zool. Univ. Michigan, No. 254, Feb. 9, 1933, pp. 1-10, and Misc. Publ. Mus. Zool. Univ. Michigan, No. 49, Mar. 19, 1951, pp. 1-106.

region leads me to believe that this corresponds to the Costa Rican material examined by Stuart.

The presence of *sanguiventris* on both coasts suggests that this latter form may be a lowland form.

This species is well known to the people of Costa Rica under the name *culebra sangre*. On the other hand *alternatus* is usually identified as *savanera* along with two or three other species. (It is also true that *culebra sangre* may be applied to the young of *Clelia clelia clelia*, and not impossibly other snakes as well.) I question that this form bears a subspecific relationship to *alternatus*, since the two forms occur together on the east as well as the west coast. None of the specimens suggest that there is intergradation. In consequence I am considering this form tentatively as of species rank in spite of obvious similarity of many structural characters.

Drymobius margaritiferus margaritiferus (Schlegel)

Herpetodryas margaritiferus Schlegel, Essai sur la physionomie des Serpens, 1837, p. 185 (type locality, "Nouvelle Orleans" *ex errore*. Designated Córdoba, Veracruz, Mexico by Smith and Taylor).
Drymobius margaritiferus margaritiferus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 89.

Seven specimens of this species were taken, all from the farm of the Inter-American Institute of Agriculture at Turrialba, except K.U.M.N.H. No. 31967, taken at La Suiza, Costa Rica, near Turrialba.

In two of the specimens, Nos. 31003-04, only the fourth and fifth labials enter the orbit; in the others the fourth also enters. The color characters are the same in all. The keeling on the scales appears on all except the two outer rows, but in males the second row is keeled and even the outer row has keels near the vent. Small apical pits are present on scales of the several median series on the anterior part of the body, growing obscure or obsolete more posteriorly.

Table of data for *Drymobius m. margaritiferus*

No.	*Age or Sex*	*Supralabial*	*Infralabials*	*Ventrals*	*Subcaudals*	*Scale formula*
31000	yg	9–9	10–10	140	*	17–17–15
31001	♀		10–10	147	*	17–17–15
31002	♀	9–9	10–10	147	111	17–17–15
31003	♂	9–9	10–10	148	*	17–17–15
31004	♂	9–9	10–10	145	*	17–17–15
31005	♀	9–9	10–9	143½	*	17–17–15
31007	♀	9–9	10–10	144	*	17–17–15

* Tail defective.

Drymobius rhombifer (Günther)

Fig. 11

Coryphodon rhombifer Günther, Proc. Zool. Soc. London, 1860, p. 236 (type locality, Esmeraldas, Ecuador).
Drymobius rhombifer Cope, Proc. Amer. Philos. Soc., vol. 31, Dec. 23, 1893, p. 344 (Palmar, Costa Rica).
Drymobius rhombifer Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 89-90.

FIG. 11. *Drymobius rhombifer* (Günther). K.U.M.N.H. No. 31976; Golfito, Puntarenas Prov., Costa Rica. (Reduced somewhat. Actual total length, 980 mm.)

One specimen of this snake was taken at Golfito in heavy forest in the low mountains at an elevation of approximately 200 ft. It is a male, and the following characters obtain: Scale formula (21-19 on head), 17-17-15; the scales, except four outer rows anteriorly, and outer row throughout except in region of vent, with heavy keels, and a pair of "apical pits." The pits do not continue on outer row nor do they extend onto the tail. Ventrals, 145; subcaudals, 96; anal divided; supralabials, 9-9, the fourth, fifth, and sixth entering orbit; infralabials, 9-9, five touching first chinshield; one preocular, two postoculars; maxillary teeth, 32, increasing in size posteriorly without a diastema. Color of body typically gray and black, the head rather grayish on top and sides, with some small black flecks; chin, throat, and belly immaculate on anterior half of body, latter part of body with some darker pigment, becoming denser on the tail. The darker blotches on back are somewhat indefinite with a gray center; the whole blotch separated from the next in series by somewhat darker gray color; on neck there is a median gray line for some distance. Toward the tip of the tail the black color is arranged in three lines, the outer ones continuous, the median broken.

"The snake was first observed at some distance from us running rapidly over a fairly clear forest floor, evidently having discovered our presence from a distance. Finally it disappeared behind a large tree trunk. Baker and I ran to the tree but at first no snake could be discovered and we finally concluded that hidden by the trunk the snake had escaped by keeping the trunk behind and going in the opposite direction. Later we returned past the tree and discovered the snake in an overlooked crevasse in the trunk at a point about three feet from the ground." (From field notes.)

Drymobius chloroticus (Cope)

Dendrophidium chloroticum (Cope), Proc. Amer. Philos. Soc., vol. 23, 1886, p. 278 (type locality, Guatemala).
Drymobius chloroticus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 90-91.

One specimen, K.U.M.N.H. No. 31969, was taken at Cinchona, Volcán Poás, Costa Rica. The coloration is typical. The ventral count is 183; the subcaudal count is incomplete the tail being defective. Apical pits are present on scales.

This species has a wide range, extending as far north as San Luis Potosí in Mexico.

Drymobius melanotropis (Cope)

Dendrophidium melanotropis Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8, 1876 (1875), p. 134, pl. 26, fig. 1, (type locality, Costa Rica).
Drymobius melanotropis Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 91.

A small specimen of this species, K.U.M.N.H. No. 31973, was taken at Estrella, Costa Rica, by Sr. Marco Tulio Pacheco. The specimen is discolored by preservatives but is otherwise in good condition.

The following scale characters obtain: ventrals, 149; subcaudals, 94; anal divided; scale formula, 17, 17, 15; supralabials, 9-9, the fifth and sixth entering orbit, the fourth very narrowly excluded; eighth greatly elongate; infralabials, 9-10, five touching first chinshields.

The lower parts of the supralabials, chin, venter, and subcaudal area is yellowish white in preservative, the dorsal coloration of body occupying the end of ventrals.

Dendrophidion percarinatus (Cope)

Fig. 12.

Drymobius percarinatus Cope, Proc. Amer. Philos. Soc., vol. 31, Dec. 23, 1893, pp. 344-345 (type locality, Boruca and Buenos Aires, Costa Rica. The adult specimen from Boruca is regarded as the type and the type locality is here restricted to Boruca).
Dendrophidion percarinatus Smith, Proc. Biol. Soc. Washington, vol. 54, July 31, 1941, pp. 73-76.
Dendrophidion dendrophis Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 92.

Three Costa Rican specimens are referred to this species. They are, K.U.M.N.H. No. 30997, Los Diamantes, Limón Prov.; No. 30998, Bataan, Limón Prov.; No. 31948, Golfito, Puntarenas Prov. In listing the Costa Rican snakes in my review (Taylor *loc. cit.*) I overlooked a paper dealing with the genus *Dendrophidion* by Dr. Hobart M. Smith who points out that the name *dendrophis* is not available for any Central American *Dendrophidion,* and suggests that specimens so identified having a divided anal scale, should be called *Dendrophidion percarinatus* (Cope). Hence this name will replace *D. dendrophis* in the Costa Rican fauna.

No specimen of this genus was available to me when I compiled data for the review of the Snakes (Taylor *loc. cit.*). I submit the following general description of the species:

Rostral rather narrowly visible above; internasals as long as wide; prefrontals wider than long; frontal a third longer than wide, its length greater than its distance from tip of snout; supraoculars more than twice as wide as long, narrower than frontal; parietals

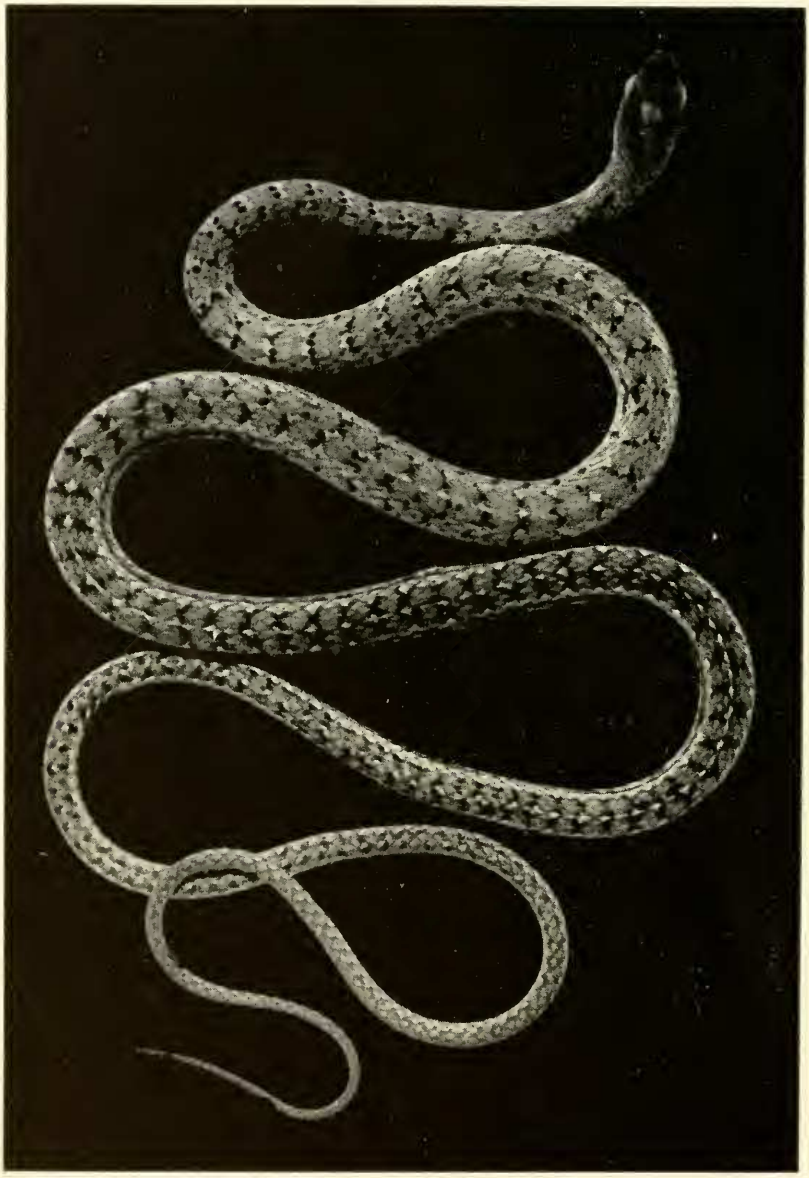

FIG. 12. *Dendrophidion percarinatus* (Cope). K.U.M.N.H. No. 31948; Palmar, Puntarenas Prov., Costa Rica. (Actual total length, 840 mm.)

a fourth longer than wide, their length equal to their distance from about middle of prefrontal; nasal divided, the posterior part the higher; loreal a little less than twice as long as high; one large preocular separated from frontal; two postoculars, upper the larger;

temporals, 2 + 2 + 3; supralabials, 9-9, the fourth, fifth, and sixth border orbit; infralabials, 10-10, five bordering the first chinshields, which are a little shorter than the second pair; latter scales separated by smaller scales. Scale formula, (21-17)-17-15; the scales of all but the outer row strongly keeled, however, anteriorly the first four rows lack keels on the neck and the second row is keeled on latter half of body. Most of the body scales, as well as those on tail, with apical pits. Ventral and subcaudal counts are as follows for the three specimens: No. 30997: ventrals, 164; subcaudals ?; anals 2. No. 30998: ventrals, 151½; subcaudals, 154; anals, 2. No. 31948, ventrals, 159; subcaudals, 156; anals, 2.

The characteristic color pattern is indicated by the figure given here (Fig. 12). Variation in caudal counts are from 142 to 163.

Smith gives Tilarán, Guanacaste, Costa Rica as a locality for this species. The range is from Honduras to Panamá.

Dendrophidion vinitor Smith

Dendrophidion vinitor Smith, Proc. Biol. Soc. Washington, vol. 54, July 31, 1951, pp. 73-76 (type locality, Piedras Negras, Guatemala).

This species was omitted from my "Review of the Snakes of Costa Rica." It may be diagnosed by the following characters:

Rostral broader than high, the portion visible above a third the length of internasals; frontal pentagonal, longer than its distance from tip of snout; nasal completely divided; loreal a little longer than high; one large preocular not reaching frontal; two postoculars, upper largest; two anterior temporals; supralabials nine, the third, fourth, and fifth bordering orbit; diameter of eye three times its distance from labial border; infralabials nine, five touching anterior chinshields, which are larger, but their length is equal to posterior pair.

Scale formula: 17-17-15, strongly keeled except on outer row; ventrals, 151-169; subcaudals, 115-126, length 1453 mm., body 948 mm. (tail incomplete).

Color in life: (taken from field notes). Dorsal surface of head brownish gray with a slightly reddish tinge, the sutures darker; upper parts of four anterior supralabials with a reddish tinge; dorsal head color extending laterally in temporal region onto upper edges of two postorbital supralabials, covering the last entirely; this color bordered below by dark brown, mixed with dull, brownish brick-red; lower parts of 7th and 8th infralabials all of 5th and 6th, and and lower parts of 3rd and 4th pure white; 59 bands on body, 54 on tail; band on neck covering one scale-length, brownish gray laterally,

yellow dorsally; size of yellow dorsal area, in the light bands, decreasing posteriorly, light bands margined anteriorly or posteriorly (or both) by narrow, irregular areas of black; light bands becoming practically indistinguishable on posterior part of body; tail bands and those on posterior part of body black; black borders of light bands interspersed with or themselves bordered by brick-red, this color especially prominent medially; central ground color between bands, browish gray anteriorly, becoming light brown tinged with red on middle and posterior part of body; tail with a lateral stripe of dark brownish black, interspersed with brick-red, involving edges of subcaudals and lower half of outer scale rows; medially it is bordered by a light line two half scale-rows wide; these two light stripes enclose two series of transverse, short dark spots (less than one scale-length), separated from each other by a series of vague light spots; gular region white; belly yellow; subcaudal surface yellow, lighter posteriorly.

Pseustes poecilonotus chrysobronchus (Cope)

Spilotes chrysobronchus Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8, 1876 (1875), p. 136, pl. 28, figs. 11a, 11b (type locality, southeastern Costa Rica, by inference).

Pseustes poecilonotus chrysobronchus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 92-94 (*part.*).

A specimen of this species was taken at Turrialba, K.U.M.N.H. No. 8738. The following characters obtain: a single preocular separated from frontal; prefrontal narrowed laterally, wider than long, not reaching frontal; frontal equals its distance from tip of snout; parietals as long as wide or slightly longer; nasal divided; temporals, $2 + 2$, $(\frac{2}{1} + 2)$; supralabials, 9-9, the fourth, fifth, and sixth bordering orbit; infralabials, 12-12, seven touching the first chinshields; two touching second; scale formula: 21,23,25,17,15,(14); most scales except outer row with well-defined apical pits, and anteriorly the three median rows, more posteriorly, all rows except outer, with keels, three median rows most heavily keeled; seven labials touching first chinshields. The ventrals are 206; anal single; subcaudals, 147.

The head and neck are coal black except for some white on outer one or two rows. Chin, throat, and anterior part of venter cream white. The pigment begins to encroach on the ventrals at about no. 45 and soon the undersurface is uniformly black on venter and subcaudal region save for an occasional cream spot. Outer part of anterior ventrals with discrete black spots.

A specimen of this species was inadvertently associated with *Pseustes shropshirei* in my review of the Costa Rican snakes (Taylor *loc. cit.*).

This specimen has the scale formula, 21,23,25,13(15); the ventrals are 214, the tip of the tail missing.

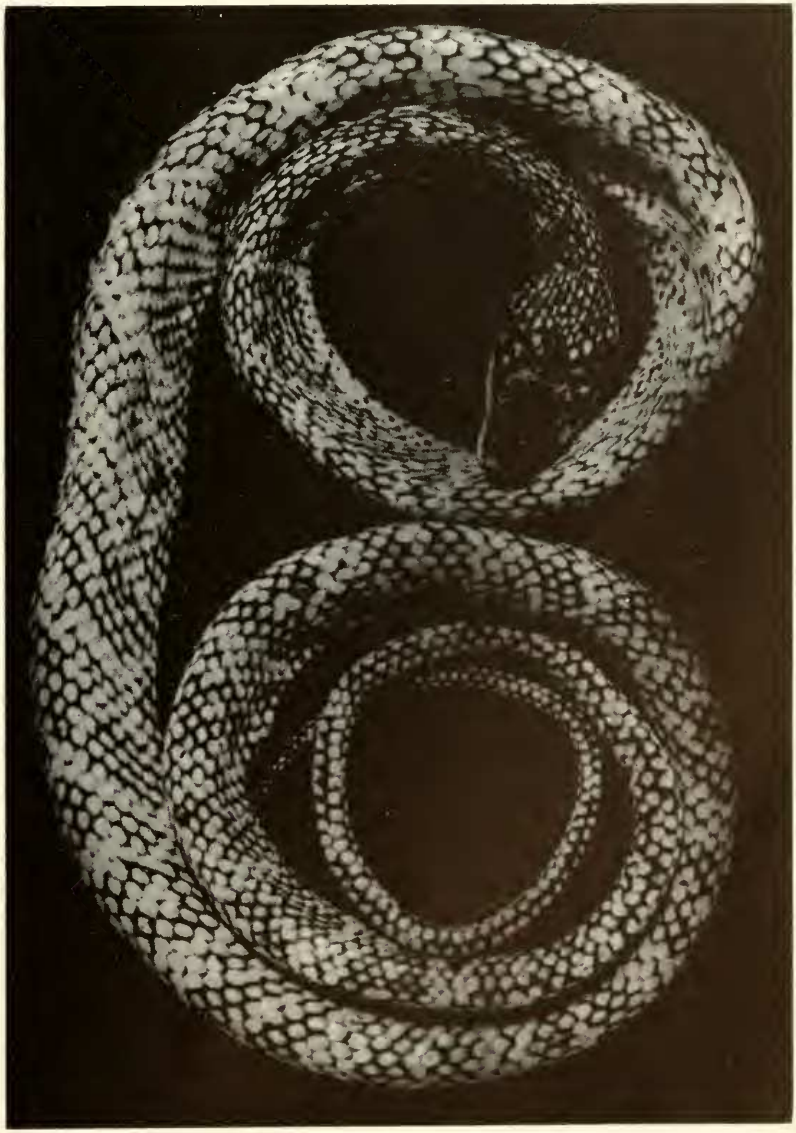

FIG. 13. *Pseustes shropshirei* (Barbour and Amaral). K.U.M.N.H. No. 25173; Costa Rica. (Actual total length, 1,543 mm.)

Pseustes shropshirei (Barbour and Amaral)

Fig. 13

Phrynonax shrophirei Barbour and Amaral, Occ. Papers Boston Soc. Nat. Hist., vol. 5, Sept. 12, 1924, p. 131 (type locality, vicinity of Gatun, Canal Zone, Panamá).
Pseustes shropshirei Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 94 (*part.*, not R.C.T. 682).
Pseustes poecilonotus chrysobronchus (*part.*) Taylor, *op. cit.* p. 93. (Specimen described from Turrialba [K.U.M.N.H. No. 25173].)

A specimen of the above species taken 5 km. SE of Turrialba was inadvertently referred to *P. p. chrysobronchus* in Taylor (*loc. cit.*). A figure of this specimen showing the light phase of color, is presented here.

Chironius grandisquamis (Peters)

Spilotes grandisquamis Peters, Monatsb. Akad. Wiss. Berlin, 1868, pp. 451-452 (type locality, Costa Rica).
Chironius grandisquamis Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 96-97.

Only a single male specimen, (K.U.M.N.H. No. 34900,) of this species was taken. It was moving about on the forest floor and took refuge in a rotting hollow log from where it was dislodged with considerable difficulty. The following characters obtain: ventrals, 162, subcaudals, 144, scale formula: 10,10,8,8; the two median rows heavily keeled, the keels not quite as high as the midridge of body, the outer row is smooth throughout, irregular; second row larger than first and near middle of body a few faint keels can be seen; the third row has faint keels along the middle of body. The fourth row is smooth. Single apical pits can be detected on many of the nuchal scales; supralabials, 9-9, fourth, fifth, and sixth bordering orbit; infralabials, 10-10, five touching chinshields.

The anterior color is brownish black with some lighter marks either crossing back or indicated on skin between scales, with an occasional cream edge on a scale. A few black spots along outer scale row and on outer part of ventrals. The chin and ventrals on the anterior part of the body are cream-white but at the 106th ventral, the black from the outer ends of the ventrals begins to encroach on the scales and in the latter two fifths of the body the ventrals are black with only occasional white flecks; the subcaudal region is black with white spots or flecks along the inner edges of the subcaudals. Dorsally the latter two fifths of the body is blackish with the transverse marks indicated by an occasional light area on a scale.

Chironius melas (Cope)

Herpetodryas melas Cope, Proc. Amer. Philos. Soc., vol. 23, 1886, p. 278 (type locality, Nicaragua).
Chironius melas Taylor, Univ. Kansas. Sci. Bull., vol. 34, pt. 1, No. 1, Oct. 1, 1951, p. 97.

I have not examined the type of this species and do not know its sex. I have suspected that the specimen may be a female with the keeling obsolete and in consequence I am referring to the species two Costa Rican *Chironius*, one K.U.M.N.H. No. 34892 from 20 miles WSW of San Isidro del General, and No. 34895 from Estrella, Limón Province.

The specimen from San Isidro del General is shiny black above on head and body, with the anterior venter, throat, and chin, as well as the lower half of the supralabials cream-white. The posterior half of body, and tail are deep black. The loreal is nearly square and the preocular is divided, the upper part widely separated from the frontal. The temporals are 1 + 1 + 1, the anterior small. The ventrals are 158; subcaudals, 142; the anal divided. The supralabials are 9-9, the fourth, fifth, and sixth enter orbit; infralabials, 10-10, the first five touch the first chinshields; there are three touching the second chinshields. The scale formula is 10-10-8-8, with the fifth median rows very strongly keeled, the first and fourth rows smooth, the second and third with lighter keels.

My specimen from Estrella is larger than the preceding but it agrees in the characteristics of color, scale formula, and the keeling of the scales. However, the preocular is not divided, the temporals are 1 + 2, the ventrals are 164, the subcaudals, 143; the number of labials and their relationships are the same. I can discern no apical pits in these specimens.

Should it prove that the males of *Chironius melas* are unkeeled it will be necessary to separate these specimens from *melas*.

Drymarchon corais melanurus (Duméril, Bibron, and Duméril)

Spilotes melanurus Duméril, Bibron and Duméril, Erpétologie Générale . . . vol. 7, pt. 1, 1854, pp. 224-225 (type locality, "Mexico," restricted to Chichen Itzá, Yucatán).
Drymarchon corais melanurus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 99-100.

A specimen, K.U.M.N.H. No. 34877, in the collection, was taken by John Baker, at Turrialba. The length of the parietals is equal to their distance from the prefrontal-internasal suture. The specimen agrees in other discernible characters with the one described by Taylor (*loc. cit.*).

The width of the head is 56 mm.; the length 72 mm.; the body is mutilated. Head brown; the labial sutures, except between first and second supralabials, and the first three infralabials, are heavily outlined in black and a strong diagonal black stripe is present on the sides of the neck.

Leimadophis taeniurus juvenilis Dunn

Leimadophis taeniurus juvenilis Dunn, Copeia, 1937, no. 4, p. 213, (type locality, San José, Costa Rica); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 102.

K.U.M,N.H. Nos. 31899, 31900 from Cinchona and No. 31901, Guadalupe, San José, Leslie Holdridge, coll., are in the collection. No. 31899 is an adult female, containing eight or nine eggs.

The ventrals of the adult specimen are 142, subcaudals, 60; No. 31901, ventrals 144, subcaudals, 59; No. 31900, ventrals, 144, subcaudals, 51. The anal is divided in all.

Pliocercus arubricus sp. nov.

Fig. 14

Type: K.U.M.N.H. No. 31943; Isla Bonita, southeastern slope Volcán Poás, elevation approximately 5,500 feet; collected July 19, 1952 by Edward H. Taylor.

Diagnosis: A species of *Pliocercus* lacking red coloration. Black, with lighter bands that dorsally are light lavender with black spots on each scale, gradually becoming white on side and venter, the bands three to three and a half scales wide on body and tail; intervening black areas more than twice as wide on body mesially, covering anteriorly five or five and a half scale-rows, posteriorly on body six to seven and a half rows; on tail the black covers ten to thirteen scales and a space three to four times greater than light bands. Two preoculars; two postoculars, the fourth and fifth labials entering orbit; temporals, 1+1, separated from orbit. Scale formula, 21-19, 17, 17.

Description of type: Rostral much broader than high, visible above as a line; internasals moderate in size, not especially small, their width a little greater than their length; their common suture equals half of the suture between prefrontals; latter scales about as long as wide, narrowed laterally; frontal hexagonal, the sides parallel, the length greater than distance to the tip of the snout, generally shield-shaped; parietals much longer than wide, their length equal to their distance from internasals; nasal divided or at least partially divided; loreal large, somewhat rhomboidal; two preoculars, the upper large, widened near top, separated from frontal; lower

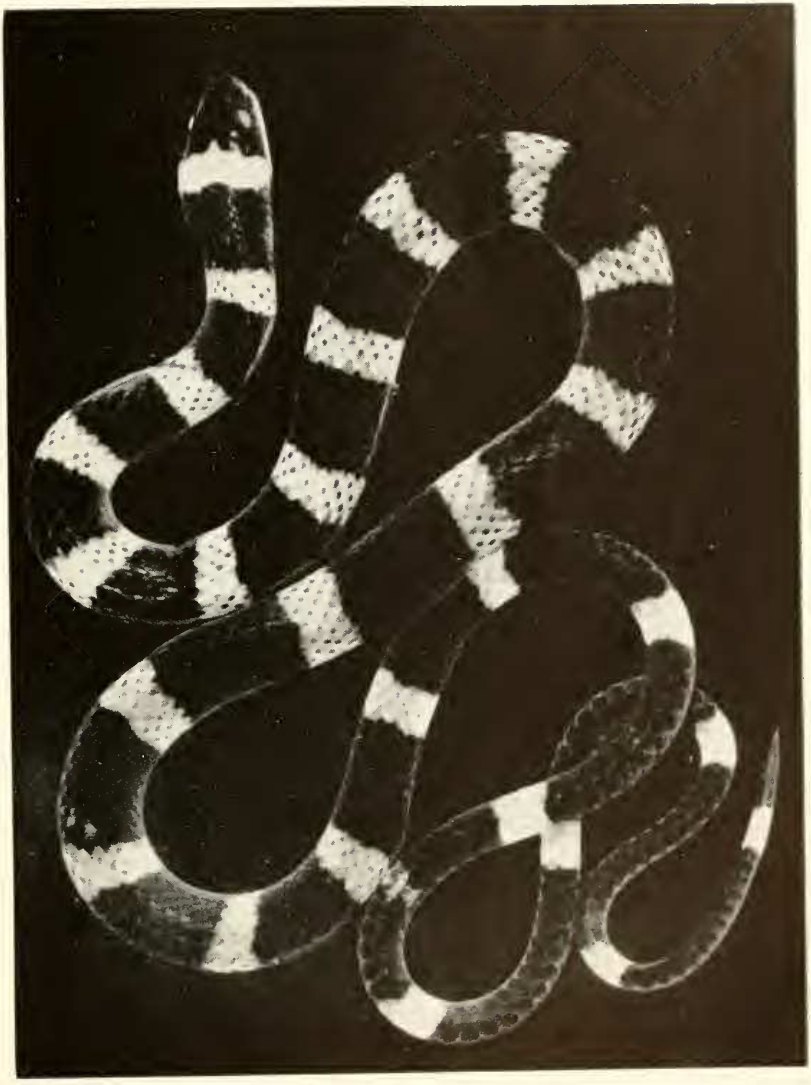

FIG. 14. *Pliocercus arubricus* sp. nov. Type. K.U.M.N.H. No. 31943; Isla Bonita (Cinchona), Volcán Poás, Costa Rica. (Actual total length, 580 mm.)

preocular wedged between the third and fourth labials; two postoculars, the upper the larger; one anterior temporal, narrow, not entering eye; one secondary temporal; upper labials, 8-8; the fourth and fifth entering orbit; supralabials in the following ascending order of size: 1,2,3,4,5,6,8,7; infralabials, 9-9, five in contact with first chinshields; second pair of chinshields a little longer and narrower than first pair; mental triangular.

Scales smooth, in 21-19 rows on neck, 17 on body, 17 in front of vent; no apical pits; ventrals, 139; anal divided; subcaudals, paired, 112.

Color: Generally intense black with series of lighter bands. On head cream spots on anterior supralabial, mental, and rostral; a clear cream band on head covering latter half of parietals and connecting with the white on chin; first black spot begins just back of the parietals and is partially broken ventrally; anterior infralabials black; 18½ black areas on body and neck, 8½ on tail; 26 light bands. These becoming white on sides and on venter covering three to three and one half scale-lengths; the black bands are variable, usually covering five scale-lengths anteriorly; six to seven and one half posteriorly on body; on tail from ten to thirteen.

Measurements in mm.: Total length, 580; tail length, 235; width of head, 9.8; length of head, 17; tail in total length, 2.46 times.

Remarks: This form, lacking red coloration seemingly represents different stock from *dimidiatus, annellatus* or *euryzonus.* It is surprising that the markings on the head should mimic those of *annellatus* to such a degree.

Owing to the loss of the terminal part of the tail, comparison of the relative tail-body length cannot be made, nor can comparison be made on the ventral counts since one is male, the other a female. The number of 139 ♂ for ventrals is very nearly the same 137 ♀ for *annellatus.* The frontal is somewhat longer and the number of light bands on the body is smaller. There is rather close conformity between the two on the general characters of the head scales.*

Rhadinaea decorata decorata (Günther)

Coronella decorata Günther, Catalogue of the colubrine snakes in the collection of the British Museum, 1858, pp. 35-36 (type locality, Potrero Viejo, Veracruz, Mexico [restricted]).

Rhadinaea decorata decorata Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 113-116, pl. 11.

Specimens of this species in the collection are K.U.M.N.H. Nos. 30960, Turrialba, 31940, Limón, and 31942, Turrialba, 31941, Tenorio. The first two agree with the specimen described and figured by me. (*loc. cit.*).

Scale data on *Rhadinaea decorata decorata* (Günther)

Number	30960	31940	31942
Sex	♂	♂	♂
Ventrals	117	125	124
Subcaudals	58+	68+	82+
Maxillary teeth	20	20	19

* The figure 4 of the type of *Pliocercus annellatus* shows only a single preocular; actually the small lower is present but not indicated in the sketch.

A specimen K.U.M.N.H. No. 31941 from Tenorio, Guanacaste, Costa Rica has practically the same head markings as the preceding save that the dorsolateral line is on the edges of the fifth and sixth scale rows and is limited below by a fine black line. The dorsal scales (five and two half rows), are nearly uniform brown. The dots on the outer edges of ventrals are small. The ventrals are 125, the subcaudals 100. The ocelli on the head are the same, the third one beginning the lateral line. The labials are white, bordered by a dark line, and the upper part of the preocular has a lighter spot.

In life the specimen was dark wood-brown above, the dorsolateral line cream, the head and neck spots having a brownish tinge. The lips, chin, neck, and throat were white, the venter was pink, the outer scale row also having this color.

Rhadinaea serperaster Cope

Fig. 15

Rhadinaea serperaster Cope, Proc. Acad. Nat. Sci. Philadelphia, Oct. 24, 1871, pp. 212-213 (type locality "near San José, Costa Rica").
Rhadinaea serperastra Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8, 1876 (1875), p. 140; Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 112-113.

In my review of the Snakes of Costa Rica I followed the second spelling of Cope (see above) which I presumed was a correction of the first name. However, the first spelling, *serperaster* * I believe, must stand, despite the fact that Cope used the second spelling also in a later paper (U. S. Nat. Mus. Bull. no. 32, 1887, p. 80) and may have intended to show the first usage an error. However, I fail to find mention of this fact in print.

Two specimens of this strongly striped species are in the collection. One, K.U.M.N.H. No. 30948 ♂, was taken from under a stone at the edge of the road on Volcán Barba, elevation approx. 6,000 feet, July 15, 1951; and a second specimen No. 31953 ♀, was found in moss on the southeast slope of Volcán Poás at Cinchona, approximately 5,600 feet, July 24, 1952, while searching for salamanders.

The ventral-subcaudal counts are, respectively, 166½, 69; 172, 72; scale formula, 19-19-19.

The light area across the frontal forms two indistinct light spots and the light lines on body are widened at their terminations on the neck leaving a suggestion of six spots. Head generally black

* These words in an available lexicon have the following meanings:
Serperaster—tri = hanger on.
Serperastra—orum (n. pl.) = knee splints; severe officers.

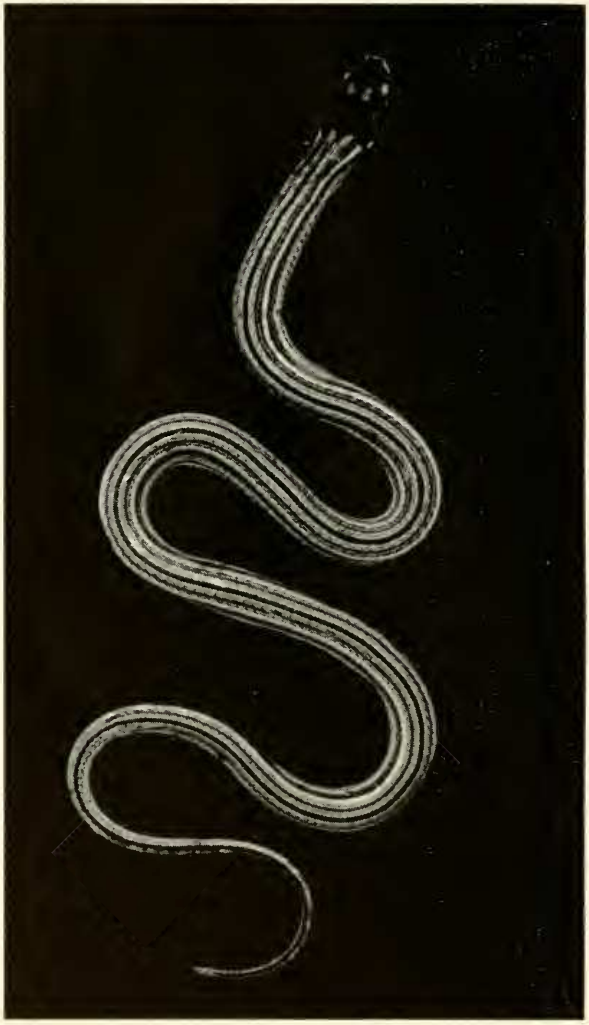

FIG. 15. *Rhadinaea serperaster* Cope. K.U.M.N.H. No. 31953; Cinchona, Volcán Poás, Costa Rica. (About natural size; young specimen.)

with white spots on the upper labials. Chin white with some darker flecks on the lower labials. The general color pattern agrees with that of the type. The anterior chinshields of these two specimens are much larger and longer than second pair. Maxillary teeth 15 + 2 without distinct diastema or groove.

The younger specimen has the first five subcaudals undivided. The loreal is rectangular rather than square.

Rhadinaea decipiens rubricollis subsp. nov.

Type: K.U.M.N.H. No. 31956. Collected, June 23, 1952 at Cinchona, Volcán Poás, Costa Rica. Elevation approximately 5500 feet, Edward H. Taylor, collector.

Diagnosis: A black snake with an indistinct white dotted line on outer scale row; a narrow red collar on neck extending over one scale row and back part of parietals, widening in temporal region and narrowly connecting with pinkish ventral coloration of chin; head reddish brown, the brown color not bordered by blackish posteriorly; anterior upper and lower labials lavender, partly outlined with darker pigment; chin bright pink. Scales in 17 rows; supralabials eight; infralabials nine; two pre- and two postoculars; temporals, 1 + 1 + 2; head distinct from neck; maxillary tooth series 15 or 16 with two somewhat enlarged teeth separated from the series by a short diastema. No apical pits discernible.

Description of type: Head elongate, distinct from neck; rostral more than one and one-half times as wide as high, visible above as a narrow triangle, less than half length of internasals; latter scales distinctly broader than long, their length nearly two thirds of the length of the prefrontals; latter scales wider than long; frontal one-third longer than wide, the sides slightly emarginate, its length more than a third greater than its distance from tip of snout; parietals rather slender, longer than their distance from tip of snout; supraoculars twice as long as wide; nasal divided, the two scales of nearly equal size and height (the posterior a little larger on one side); loreal about as wide as high; two preoculars, the lower small, wedged between the third and fourth labials, upper large, twice as wide as high, visible above but separated from frontal; two postoculars, upper largest, both touching the long narrow anterior temporal; temporal formula, 1 + 1 + 2; supralabials eight in the following order of size: 1,2,3,4,5,6,8,7, the fourth and fifth border orbit; nine infralabials, the first five border the first chinshields, which are shorter, but a little wider than second pair; latter in contact for three fourths of their length. Scales in about 21 rows on back of head; on body the formula is 17-17-17; the ventrals are 130, anal divided; 126 subcaudals; scales smooth without apical pits. The type, a young specimen, presumably a male, has no trace of keels on sides above vent. Diameter of eye equal to its distance from nostril.

Color: In life, body black, head reddish brown; a reddish band across back of parietals and nape, widening in temporal region. A

very narrow blackish line from eye to near jaw angle, not severing completely the nuchal band; supralabials lavender, more or less dark edged; chin and infralabials pink, the mental, five anterior labials, and the first chinshields with some dark pigment; first scale row with small paper-white spots that form a dotted line; lower part of first row with black dots more or less contiguous with well-defined black spots on outer edge of ventrals; venter for four fifths of its length flesh white; remainder of body and subcaudal region bluish white.

Measurements in mm.: Snout to vent, 121; tail, 81; total length, 202; width of head, 5.1; length of head, 10; tail in total length, 2.4 times.

Remarks: This species appears to be clearly differentiated from other *Rhadinaea* of Costa Rica, except *Rhadinaea decipiens* (Günther), by the low ventral and high subcaudal count. It seemingly differs from the types of the latter species which came from Irazú (volcano?) as follows: Head distinct from neck; reddish brown, with a red band on back of head; chin reddish pink; the narrow dashed line absent from the fifth scale row; the line on outer scale row is a connected series of dots rather than a dashed line. The maxillary teeth are 17 or 18, the two posterior teeth (without grooves) a little the largest with a small distinct diastema separating them from the maxillaries; ventrals 130, are fewer and the subcaudals 125, are more numerous than in *d. decipiens,* totaling 256. (In the three types of *decipiens,* ventrals 133-151; subcaudals 110. One specimen with complete count has a total of 243.)

Rhadinaea altamontana sp. nov.

Fig. 16

Type: K.U.M.N.H. No. 30962. Collected at the edge of the Costa Rican National Forest Reserve, Pan-American Highway, Talamanca Range, Costa Rica. Elevation between 7000-8000 ft. Collected by Edward H. Taylor and Jack Reark.

Diagnosis: A *Rhadinaea* with a short, rather broad head related to *R. godmani;* head blackish with a short white line present from eye; chin and venter white. A narrow median dark line from neck to tip of tail, bordered by a broad lighter band, six scales wide, below which is another slightly darker band four scales wide but the scales on this band have lighter centers also; scales in 21 rows on neck and body throughout. Male with strong keels or knobs on lateral scales above vent.

Description of type: Rostral at least one and a half times broader than high, narrowly visible above for about one third of the width of the internasals; latter scales wider than long, their length more than half the length of the prefrontals which are wider than long; frontal longer than wide, pointed behind, its length slightly longer than its distance from tip of snout, much shorter than parietals;

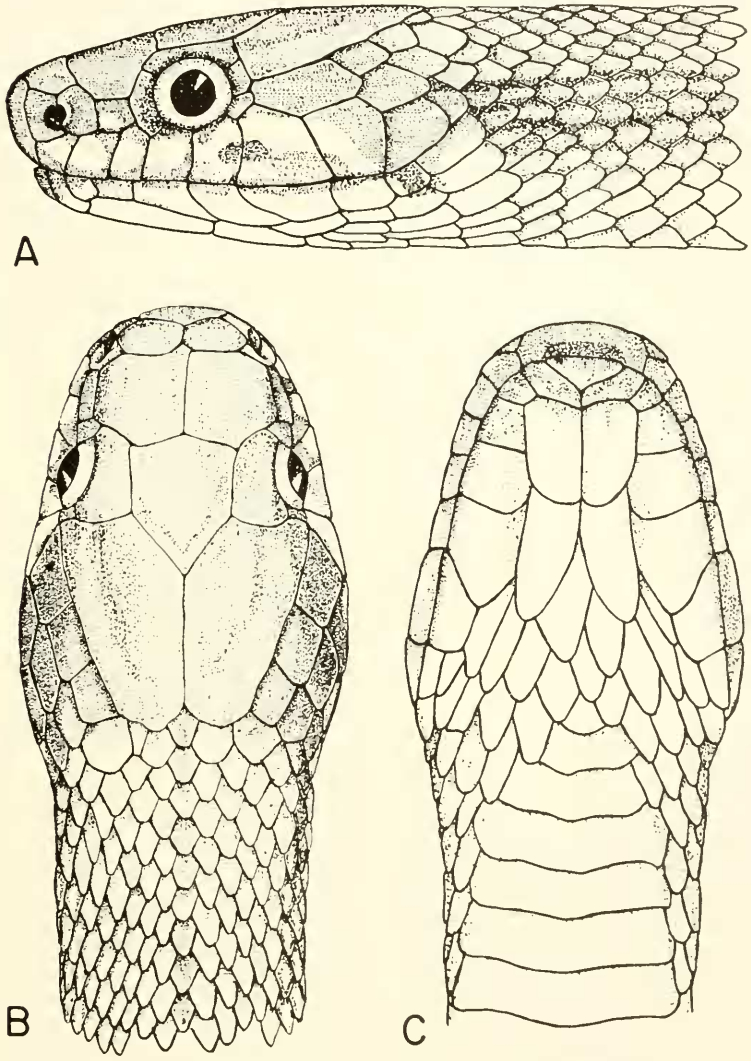

FIG. 16. *Rhadinaea altamontana* sp. nov. Type. K.U.M.N.H. No. 30962; Forest Reserve, Pan American Highway, East slope of the Talamanca Range, Costa Rica. (× 5.)

latter more than a half longer than wide, their length equalling their distance from rostral; nasal divided, the nostril cut chiefly in the anterior; the posterior nasal higher than anterior; loreal slightly longer than high; an elongate preocular twice as high as wide, widely separated from the frontal; supraoculars much longer than wide; two postoculars, upper largest, both touching anterior temporal; temporals, 1 + 2 + 3; supralabials eight, the fourth and fifth border orbit, their ascending order of size, 1,2,3,4,8,5,6,7; infralabials eight, four anterior touching the first pair of chinshields, which are as long as, but a little broader than second pair; latter separate for about half their length.

Scales about back of head 24; on neck one inch back and on body the formula is 21-21-21. Scales somewhat acuminate without apical pits. Ventrals, 170; anal divided; subcaudals, 83. The scales on sides above vent have very strong keels or knobs. The maxillary teeth are 19, increasing in size posteriorly, the last two largest but not separated by a noticeable diastema.

Color: In life, head blackish above and on sides; body brownish generally; ventral surfaces yellowish cream. First five labials with yellowish cream spots; beginning in upper part of fifth supralabial and continuing across upper part of sixth and diagonally across seventh, is a well-defined cream line terminating on the cream yellow color of chin after crossing seventh infralabial; a slightly lighter area bordering black edge of rostral, and a dim light spot on loreal; indication of a transverse lighter band following the black of the head which is limited below by a narrow indistinct extension of the black color of the head; two slightly lighter areas on parietals; a median gray-black line on median dorsal scale row extending to tip of tail; adjoining six rows brownish, the scales with lighter centers; four outer rows with lower edge of fifth forming a slightly darker band, each scale having a lighter center; outermost edge of ventrals with slight pigmentation; outer scale row largest with a more or less continuous cream stripe on outer scale row; lower labials, except sixth, more or less pigmented.

Measurements in mm.: Snout to vent, 378; tail, 152; total length, 530; width of head, 10; length of head to jaw angle, 15; tail in total length, 3.5 times.

Remarks: This specimen was taken at a higher elevation than any other snake I have found in Costa Rica. It was under a rotting log in a swampy area in an oak forest. The vegetation in the immediate vicinity was of a bog type, including very numerous small tree

ferns a few feet high. I was assisted in the capture of the specimen by Mr. Jack Reark.

This seemingly is the only southern form of the genus *Rhadinaea* having 21 scale rows on the body. I regard it as related to *Rhadinaea godmani,* a rare species occurring in Guatemala.

The most obvious differences from *godmani* (based on the data of Boulenger, Günther, and Bocourt) are a very different color pattern on body, a shorter head, black in color, and the presence of strong keels or knobs on the lateral scales above vent. From other southern forms now known it may be distinguished by the presence of 21 scale rows.

Rhadinaea persimilis Dunn

Rhadinaea persimilis Dunn, Copeia, 1938, no. 4, Dec. 10, pp. 197-198 (type locality, La Loma, 1500 ft. alt., Bocas del Toro, Panamá); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 112, 117.

This distinctive red-bellied species is represented by two specimens; K.U.M.N.H. No. 31938, La Lola, Limón Prov., Costa Rica, and No. 31939, Palmar, Puntarenas Prov., Costa Rica.

The specimen No. 31939 is described. Rostral barely visible above as a thin line; internasals wider than long, their length about one half length of prefrontals; latter wider than long; frontal shield-shaped, its length one and a third times greater than its distance from tip of snout, longer than wide; parietals as long as their distance from rostral; nasal divided, the anterior part lower than posterior; loreal about as high as long; one preocular more than twice as high as long; two postoculars; temporals, 1 + 1 + 2; supralabials, 8-8, the fourth and fifth bordering orbit; infralabials, 7-7, the first four bordering the first chinshields, which are separated from the mental by the first labials; first and second pairs of chinshields of nearly equal length. Scale formula, 17-17-17, the scales without apical pits; ventrals 135; anal divided; tail partly lost.

Five median scale rows brownish. A narrow cream-white line from neck onto tail along edges of fifth and sixth scale rows, edged with blackish; a strong discreet white line on edges of scales one and two continues onto tail, below which a black line of unequal thickness follows on outer scale row and edges of ventrals; lower part of supralabials cream, the line connecting with its fellow from opposite side around rostral; some indistinct marks on snout and above eyes; an ocellus on outer edge of parietal; a white spot behind jaw fused with dorsolateral white line; nuchal spot present; some black dots on tip of chin.

A very young specimen, No. 31938, was injured while digging at the base of a rotting tree. The ventral red was less intense in life and the dorsal color is brown with the scales showing lighter centers; the white lines on the body are bordered by blackish lines. The anterior part of the head is dark but there is a white line surrounding the rostral connecting with two white spots on the internasals; a pair of elongate spots on outer side of prefrontals, more or less connecting with the elongate spot above eye in supraocular; a dim line on front edge of frontal, one in outer angle of parietal, one on the temporal scales and one, the largest, at a point near jaw angle not connecting with the dorsolateral line; a small white spot on middle of neck; all light spots surrrounded by dark borders. The ventral count cannot be ascertained. There are 98 subcaudals.

Leptodeira nigrofasciata Günther

Fig. 17

Leptodira nigrofasciata Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 1, 1868, p. 425 (type locality, Nicaragua); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 121.

A young specimen of this rare species was discovered under a rock on the airfield at Tenorio, Guanacaste, Costa Rica, Aug. 24, 1952. Since no adequate description is given in Taylor (*loc. cit.*) I append a description of this specimen (K.U.M.N.H. No. 31932).

Rostral barely visible above; internasals as long as wide, two thirds of length of prefrontals; latter a little broader than long, their sutures with the frontal forming a straight line; frontal somewhat bell-shaped, its length greater than its distance from tip of snout, longer than wide; parietals elongate, rather narrow, their length about equal to their distance from rostral; nasal divided, posterior part larger; loreal higher than long; two preoculars, the upper widened at upper level of eye, reaching frontal, the lower wedged between third and fourth labials; two postoculars, upper largest; temporals, 1+2+3, 2+2+3, there is a small scale segmented from the first temporal; supralabials eight, the fourth and fifth bordering orbit; infralabials ten, five touch first chinshields, two touch second pair; latter equal or slightly longer than first pair.

Scale formula: 19-19-17, the scales minutely striate, each bearing a pair of minute apical pits; ventrals, 169, anal divided, subcaudals 69.

Color in life: Above brownish lavender with gray-white bands; venter nearly uniform white, the subcaudal area peppered with lav-

ender. Top of head, as far back as the end of parietals, dark, all the labials with larger or smaller areas of white peppered lightly with lavender pigment; first white band, touching edge of parietals, about four scale-rows wide; the first seven white bands complete across back, separated from each other by black areas covering nine to twelve scale rows; beyond this the eleven light bands break mesially

FIG. 17. *Leptodeira nigrofasciata* Günther. K.U.M.N.H. No. 31932; Tenorio, Las Cañas, Guanacaste Prov., Costa Rica. (Young, actual total length, 196 mm.)

and the halves tend to alternate; about nine bands on tail; dark bands on body three to four times wider than gray-white interspaces. Venter bluish white throughout. The total length of the specimen is 197 mm., the tail 43 mm.; maxillary teeth 9, increasing somewhat in size, followed after a diastema by a large grooved fang.

This species is known to range in Nicaragua and Costa Rica, in the Caribbean drainage but still remains very rare in collections.

Leptodeira annulata annulata (Linnaeus)

Fig. 18

Coluber annulata Linnaeus, Amoenitates Academicae. Tomus 1, no. 5, 1745, p. 120 (type locality not given; unknown); Systema Naturae Ed. X, vol. 1, 1858, p. 224.

Leptodeira annulata annulata Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 122-125, pl. 12.

The following specimens are referred to this form: K.U.M.N.H. Nos. 34025-34030, Palmar; No. 34024, 15 mi. W San Isidro del General on Dominical Road.

The following characters obtain:

The scale formula is 21-21-21-17-15 in all; supralabials 8-8, the fourth and fifth bordering orbit; the upper preocular touches the frontal; the infralabials ten or eleven with five or six scales bordering the first chinshields.

The general appearance of the specimens from the Caribbean drainage (Morehouse Finca and Los Diamantes) seems rather different. It may be necessary to recognize the western slope specimens under Günther's name *affinis*, but I have not sufficient specimens to determine the matter.

One large specimen figured here, I have referred to this subspecies with reluctance. It is from an unknown locality in Costa Rica. In life the venter was a lively yellow ivory, chin whitish; labials yellowish. Ventrals, 187, subcaudals, 82; 39 spots on body; the scale formula: 19-21-23-23-21-15 which is not typical, at least of the western specimens of this form. A complete understanding of this genus in Costa Rica will require much more collecting. I have not been able to find in Costa Rica any specimen referable to *Leptodeira maculata* but my failure to find it is no criterion to use in proving its absence.

I have been unable to find the rare *Leptodeira rubricata* still known from only the type, although the type locality Boca Malo, Costa Rica located at the mouth of the Río Diquis is near Palmar where collections were made. The very high number of body spots (60) and the unusual red color will easily identify this species.

FIG. 18. *Leptodeira annulata annulata* (Linnaeus) K.U.M.N.H. No. 34031; Costa Rica. (About natural size; actual total length 685 mm.)

Table of data on *Leptodeira annulata annulata*

Number	*Sex*	*Ventrals*	*Subcaudals*	*Spots*
34025	♂	194	. .	50
34026	♂	201	. .	45
34027	♂	193	95	48
34028	♀	. .		44
34029	yg"	194	98	45
34030	yg	185	87	45
34024	?	196	97	49

Leptodeira ocellata Günther

Leptodira ocellata Günther, Biologia Centrali Americana: Reptilia and Batrachia, May, 1895, pp. 172-173, pl. 55, fig. B (type locality, Chontales Mines, Nicaragua; Costa Rica); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 125.

Three specimens of this species are in the collection from Palmar—Nos. 34012-34014. The first and last are young, No. 34013 being of medium size. The longitudinal nuchal line is broken in all three specimens. The number of spots varies from 39-44 (about 38 in the types); the ventrals 171-172 (158-170 in the types); the subcaudals 83-88 (74-83 in the types). The scale formula is (26-19)-21-21 (23)-17. (The types with 23 rows). The dorsal spots on these all have lighter edges. A large, badly damaged, road specimen taken at Hotel Marabilla at the mouth of Río Barranca has the markings on the body almost exactly as described by Günther.

Scale data on *Leptodeira ocellata* Günther

Number	34012	34013	34014
Sex	♀	♂	♂
Ventrals	172	171	171
Subcaudals	83	88	86
Dorsal spots	39	44	44
Supralabials	8–8	8–8	8–8
Infralabials	10–10	10–10	10–10
Temporals	1+2+3	1+2+3	1+2+3
Labials border orbit	4th,5th	4th,5th	4th,5th
Labials touch chinshields	5	5	5
Preoculars	2	2	2
Postoculars	2	2	2
Scale formula	19,21,21,17	21,21,23,17	19,21,23,17

Leptodeira rhombifera Günther

Fig. 19

Leptodira rhombifera Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 9, 1872, p. 23 (type locality, Río Chisoy near Cubulco, Guatemala).
Leptodeira rhombifera Mertens, Abh. Senckenb. Naturf. Ges., 487, 1952, pp. 67-68 (El Salvador specimens); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 126 (data after Günther).

Collecting at Tenorio, in Guanacaste, enabled me to acquire several specimens of a *Leptodeira* that I am associating with this species. These are characterized as follows:

Reduced number of spots (31-36), a longitudinal black nuchal stripe bordered by a lighter color, the median scale count on middle of body, 23 or 25, subcaudal area pigmented more or less, frontal as long as its distance from snout; two postoculars; two preoculars, the upper barely touching or separated from the frontal, the tem-

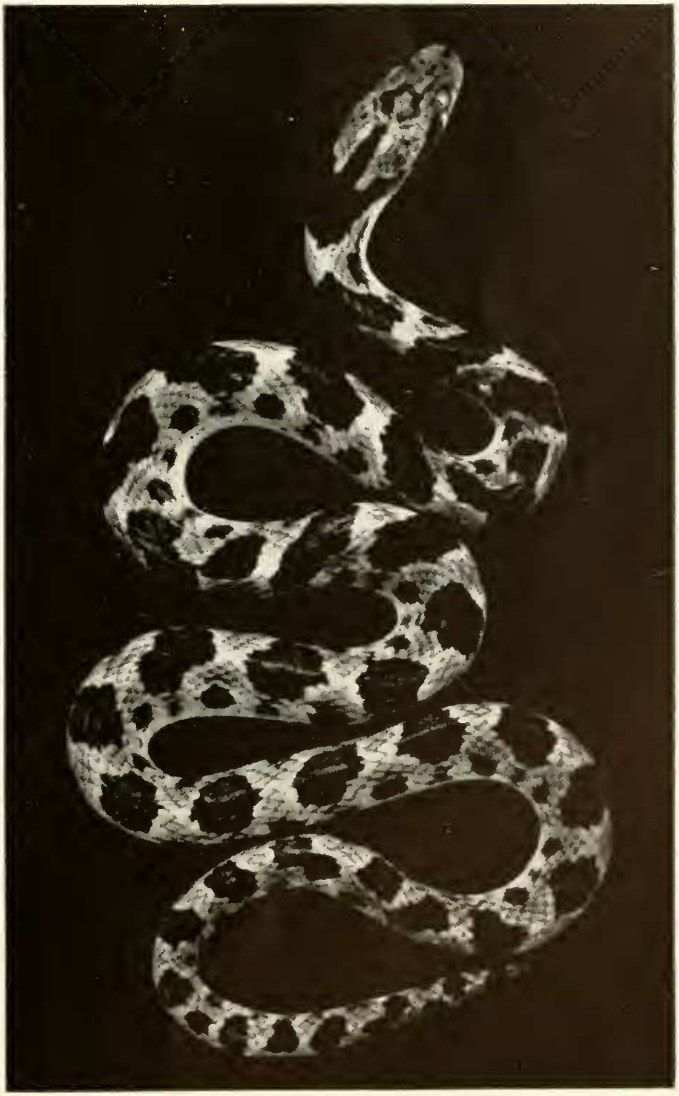

FIG. 19. *Leptodeira rhombifera* Günther. K.U.M.N.H. No. 34018; Tenorio, Las Cañas, Guanacaste, Costa Rica. (About natural size.)

porals, 1+2+3. Two specimens from near the mouth of the Río Barranca at Hotel Maribella, are included in the table.

The type has only a single preocular and 26 dorsal spots. The following table gives some variational data.

One specimen No. 34023 has an azygous scale surrounded by prefrontals and internasals, and one specimen, No. 34019, has three preoculars. It will be noted in the following table that the ventral subcaudal counts for the males are 165-168, 80-89; for females 170-175, 67-71.

Counts for a series from El Salvador given by Mertens (*loc. cit.*) are males 166-168, 77-85; females 169-175, 68-72. These obviously show no significant variation.

In all the specimens the supralabials are 8-8, the fourth and fifth entering the orbit, the postoculars 2-2. With one exception (11-10) the infralabials are 10-10 with the first five touching the first chinshields, which are of nearly the same length as the second pair; the temporal formula is 1+2+3 (in one specimen 1+2+4 on one side). The anal is divided in all. The preocular touches the frontal in four, and is separated in four.

Table of data on *Leptodeira rhombifera* Günther

Number	*Sex*	*Ventrals*	*Subcaudals*	*Body spots*	*Scale formula*
34016	♂	168	82	35	(29-21)-23-23-16
34017	♂	165	80	36	(27-21)-23-25-17
34018	♂	168	30+	31	(27-21)-23-23-17
34019	♂	168	25+	34	(28-21)-23-23-16
34022	♂	167	89	32	(27-21)-23-25-17
34020	♀	170	67	33	(28-21)-23-25-17
34021	♀	175	70	34	(29-21)-23-25-17
34023	♀	170	71	36	(27-21)-23-23-17

Oxybelis brevirostris (Cope)

Dryophis brevirostris Cope, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 555 (type locality, Veragua, Panamá).
Oxybelis brevirostris Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 128, pl. 13.

Two specimens of this species were acquired: K.U.M.N.H. Nos. 30994 and 31898, Turrialba, Costa Rica. The specimens agree well (as far as can be determined) with the specimen from Los Diamantes described by Taylor (*loc. cit.*), save that in both, the temporals differ, the upper secondary temporal being separated from its fellow by three scales, and No. 31898 ♂ has the five median scale rows keeled on the posterior fourth of the body. No. 30994, young (badly mutilated) shows no keels. The former has 176 ventrals and 164 subcaudals (177-162 in the Los Diamantes specimen).

The first subcaudal in No. 31898 ♂ is undivided, the second in No. 30994 ♀.

Oxybelis aeneus (Wagler)

Dryinus aeneus Wagler, in Spix, Serpentum Brasiliensium 1824, p. 12, pl. 3 (type locality, near Ega, Brazil).
Oxybelis aeneus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 128 & 130.

One specimen of this snake was acquired at Turrialba (K.U. M.N.H. No. 31894 ♂). I am not at all certain that the name here used is applicable to this species. The scale characters, of this specimen, follow, and should be typical for the Costa Rican population.

Rostral narrow, somewhat procumbent, visible above narrowly; prefrontals long, narrow, about three fourths of the length of prefrontals; latter about seven eighths of the length of frontal, narrow elongate, more than two and a half times longer than wide; parietals more or less notched behind; nasal elongate more than three times as long as high; the nostril diagonally placed; loreal absent; the prefrontals broadly touching two supralabials; a large somewhat quadrangular preocular not reaching upper level of head, widely separated from frontal; supralabials, 8-8, the fourth, fifth, and sixth entering the orbit; two small postoculars; temporals, 1+2; the parietals and temporals bordered behind by four large elongate scales separated by a tiny mesial scale; infralabials, 8-9, four or five touching the first pair of chinshields; first infralabials large with a common suture a third shorter than that of the first chinshields; second chinshields longer than first pair.

Scale formula 17-17-17-15-13; the scales unkeeled; ventrals 184; anal divided; 180 subcaudals all divided except terminal.

The specimen is discolored so the color description is omitted.

Imantodes inornatus Boulenger

Himantodes inornatus Boulenger, Catalogue of the Snakes in the British Museum, vol. 3, 1896, p. 88, pl. 5, fig. 1 (type locality, Hda. Rosa de Jéricho, 3250 ft., elev., Nicaragua).
Imantodes inornatus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 130-132, pl. 14.

A specimen, K.U.M.N.H. No. 31919, female, acquired at San Isidro del General, agrees with the figure given by me, (Taylor, *loc. cit.*) in color and markings. The body is strongly compressed. The following characters vary; the supraoculars reach halfway down behind eye, (perhaps fused with a postocular); there are three pre-

oculars, the upper large, touching frontal; the scale formula is 17-17-17-15, the scales smooth. The ventrals are 213; subcaudals 119; anal divided. Behind each eye is a large swollen gland completely symmetrical of orange color. It occupies an area below the last supralabials and extends somewhat under the eye. This swollen gland has been observed in certain other species of *Imantodes.*

The color characters given by Taylor, including the narrow black nuchal line, the dark dashes and dots on head, the fine median ventral line, and the dorsal marking are reproduced faithfully in this specimen.

Imantodes cenchoa semifasciatus Cope

Fig. 20

Himantodes semifasciatus Cope, Amer. Nat., 1894, p. 613 (type locality, Costa Rica and Nicaragua).

Imantodes cenchoa semifasciatus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 132-134, pl. 15, (three specimens said to be from Turrialba are actually from Cinchona [Isla Bonita]).*

Specimens from the following localities are at hand: K.U.M.N.H. No. 34032, Turrialba; No. 34033, La Lola, Limón Province; Nos. 34034, 31946, Tenorio (ranch), Las Cañas, Guanacaste; No. 34035, Golfito, Puntarenas Province, Costa Rica.

Scale data on *Imantodes cenchoa semifasciatus*

Number	*Sex*	*Pre-oculars*	*Post-oculars*	*Ventrals*	*Sub-caudals*	*Anal*	*Supra-labials*	*Infra-labials*
34032	♂	1-1	2-2	247	163	2	8-8	10-10
34033	♂	1-1	2-3	251	178	2	8-8	11-10
34034	♀	1-1	2-3	236	149	2	8-8	10-10
31946	♂	1-1	2-2	252	166	2	8-8	10-10
34034	♀	1-1	2-3	246	157+	2	8-8	10-10

There is seemingly an inconsistency in the preceding data since the females of most species of snakes have a larger number of ventrals and a smaller number of subcaudals than the males. In this form the females I have examined have fewer ventrals than the males and at the same time a smaller number of subcaudals. Thus in the males, ventrals vary from 247-252; subcaudals 163-178; in females 233-246; 149-157; total ventral counts: males, 410-429; females, 385-403. A male from Los Diamantes has 419- a female 390 ventral-subcaudal count; a pair from Tenorio have 418 and 385, a difference of 29 and 33 scales.

* They were, however, collected in 1947 at the American Cinchona Plantation, Isla Bonita, by R. C. Taylor. These specimens were kept alive at Turrialba, and later preserved there, which resulted in their having been mislabeled.

FIG. 20. *Imantodes cenchoa semifasciatus* Cope. K.U.M.N.H. No. 31946, Tenorio, Las Cañas, Guanacaste Prov., Costa Rica. (Young. About natural size.)

The specimens from eastern lowland localities have a dim median brown line discernible on the venter. One of the specimens from Tenorio, a juvenile, has blackish blotches on the back with small black spots on the middorsal line between the blotches.

The specimen from Golfito has the ground color dark brown so that the blotches are not so easily discerned. These blotches reach and extend onto the ventrals. The typical head markings, consisting of a spot on snout and two broad stripes extending to and joining on the neck are completely absent, the top and sides of head being more or less uniform brown. There are 38 body blotches on the body, while those on the tail cannot be counted with certainty. In the middle of the body the blotches may cover 5 to 5½ scale-lengths, and are separated by lighter blotches (without black spots) covering, on midline, usually less than three scale-lengths. Below, the chin and neck are white, while the greater part of the venter is strongly and coarsely peppered with brown, more dense under the tail. The gland below the sixth and seventh supralabials is yellowish as is more or less usual in *Imantodes*.

Imantodes gemmistratus Cope

Fig. 21

Himantodes gemmistratus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 13, 1861, p. 296 (type locality, "near Izalco, San Salvador").
Imantodes gemmistratus Mertens, Abh. Senck. Natur. Ges., 487, Jan. 12, 1952, p. 65; Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 135.

A single specimen, K.U.M.N.H. No. 31945, Los Diamantes, near Gúapiles, was collected by me from a bromelia. The following characters obtain:

Rostral visible at a point from above, its width distinctly greater than its height; internasals small, narrowed to a point laterally, their greatest mesial length about two thirds length of prefrontals; latter broader than long, their sutures with the frontal forming a straight line; frontal one-sixth longer than broad, its length distinctly greater than its distance from the tip of snout; supraoculars large, much wider posteriorly; parietals longer than broad, their length equal to their distance from the tip of snout, their outer edges somewhat irregular; nasal completely divided, with nostril lunate; loreal distinctly higher than long; one large preocular not reaching the frontal; two small postoculars (upper on left side fused to supraocular); temporals, 2+3+3; supralabials, 8-8, the fourth and fifth enter orbit, the temporal region swollen; infralabials, 9-10, six touch first chin-

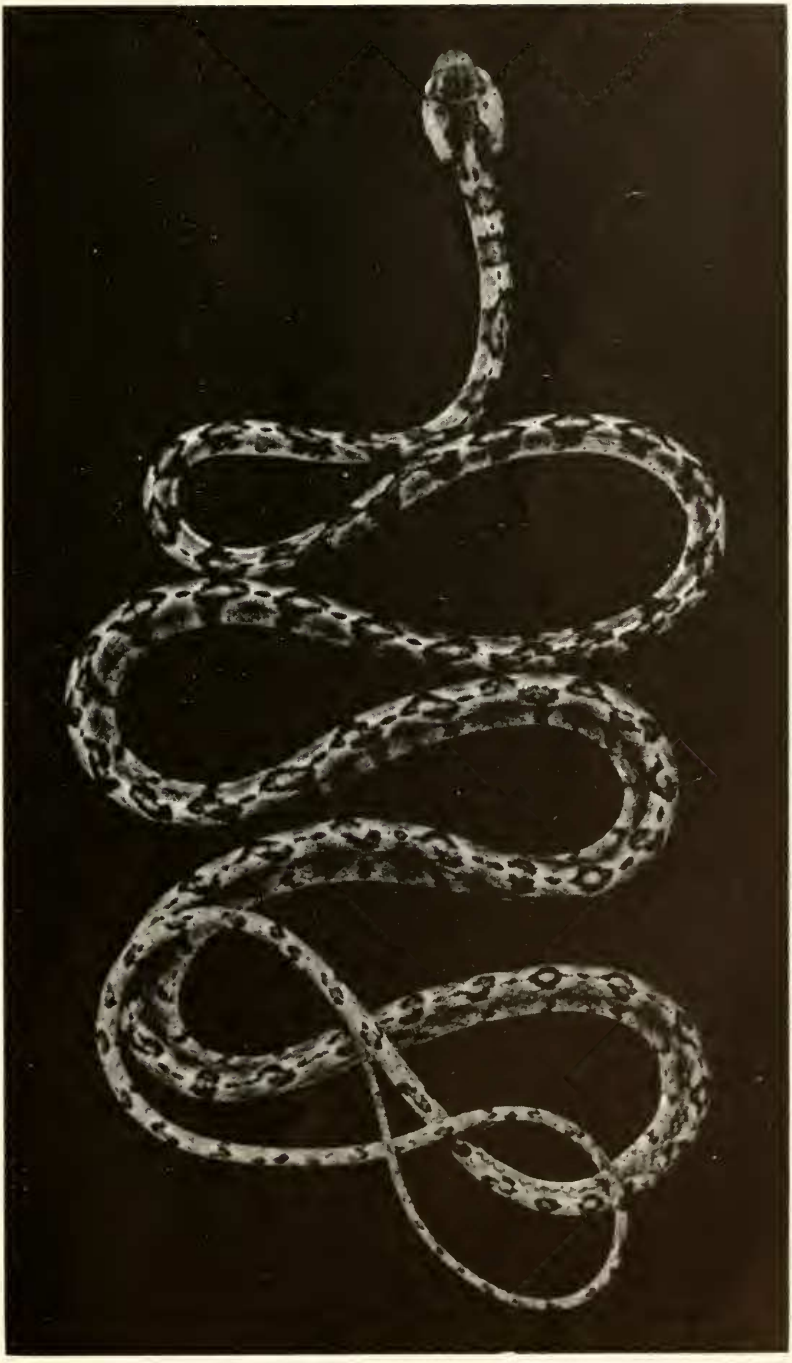

FIG. 21. *Imantodes gemmistratus* Cope. K.U.M.N.H. No. 31945; Los Diamantes, Limón Prov., Costa Rica. (About natural size.)

shields, the sixth broadly in contact with second chinshields; first labials very narrowly in contact, almost separated by mental; first chinshields wider and longer than second pair, which is separated by small scales; scale row formula: 17-17-17-15, the median row anteriorly somewhat enlarged, but throughout most of body they are one and one-half to two times the width of the adjoining scales. Scales on sides minutely corrugated, the outer row nearly smooth; ventrals, 237, anal divided, subcaudals, 144.

Color above fawn, with 59 small brown blotches reaching onto outer edges of ventrals, widest dorsally where they cover about two or two and one-half scale-lengths, and enclose a lighter spot posteriorly. On the latter half of body spots broken laterally leaving a median and two lateral dark spots; about 28 spots on tail, the spots becoming obsolete toward tip. On head a pair of broad darker-bordered stripes beginning on anterior half of parietals, terminating at eighth transverse row; these preceded by eight spots on parietals, frontal, and supraoculars; snout and sides of head with small flecks, larger flecks on rostral and first three labials. Chin white with dark dots on mental and first three labials; venter and subcaudal area peppered with tiny flecks of brown; temporal region cream.

Measurements in mm.: Total length, 595; tail, 187; width of head, 9; length of head, 11.

Remarks: This specimen does not fit into the general pattern of *gemmistratus* or of *stratissima* Cope. The latter nominal species has a ventral count of 232, subcaudals 130, total 362 (this specimen has a total of 381); the number of dorsal spots on body and tail are 108 (in this about 87). Cope's description of the markings, "bands of deep brown which narrow a little on the sides and have broadly rounded extremities at the second row of scales. The centres of the spaces between them on the side are occupied by a light brown spot. Each gastrostege has a dark brown spot on its extremity. . . ." "Three brown chevrons in the parietal region directed backwards"—suggest a very different snake from this one before me.

Cope's description of *gemmistratus* likewise shows characters differing from this. The characters in which it differs are as follows:

Scales of the median row *diamond-shaped*, longer than broad; one temporal touches postoculars; sixth inferior labial largest; 42 spots on body, connected with a dorsal vitta; belly punctulated laterally but without a median vitta. Head pale brown, varied with a few irregular darker marks; pores in scales single.

In my specimen the median scales are not in any sense diamond-shaped; the number of the spots is significantly different (42 compared to 59); head not pale brown, and I cannot discern single apical pores. Cope does not report the ventrals and subcaudals of his type.

Wettstein (Sitz. Akad. Wiss. Wien, Math.-Natur. Kl. Abt. 1, Bd. 143, Heft 1 and 2, 1934, p. 36.) reports two specimens of *Imantodes* from Port Limón of which he states: "eines zu *cenchoa,* eines zu *elegans* gehört, beweist wohl deutlich dass *elegans* nur eine ganz unbedeutende Varietät von *cenchoa,* aber keine eigene Art ist."

My specimen probably approaches *elegans* but the latter I believe definitely belongs to a species different from *cenchoa.* Whether it should be regarded as a synonym of *gemmistratus* is a matter that I regard as unsettled. An accumulation of Costa Rican materials will doubtless warrant separation from *gemmistratus* of the Costa Rican population, of which my specimen is an example.

Clelia clelia clelia (Daudin)

Coluber clelia Daudin, Histoire Naturelle, Générale et Particulière des Reptiles, vol. 6, 1803, pp. 330-331, pl. 78 (type locality, Surinam).
Clelia clelia clelia Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 135-137, pl. 16 (juvenile).

An adult specimen, K.U.M.N.H. No. 31975, was captured in 1952 as it was passing under the guest house at Moravia de Chirripo.

The scale formula is, 17,17,17,15; all the scales smooth, and as far as I can discern, lacking apical pits. Ventrals, 221; subcaudals incomplete; supralabials, 7-7, the third and fourth entering orbit; infralabials, 8-8, the first five touching the first chinshields.

Three young specimens, Nos. 31895-31897, are from Cinchona. They are typical and resemble rather faithfully the specimen figured by Taylor (*loc. cit.*) save that being younger the pigment spots are somewhat smaller.

Clelia petolaria (Linnaeus)

Coluber petolarius Linnaeus, Syst. Nat., 10th ed., vol. 1, 1758, p. 225; Museum Adolphus Friderici Regis, 1754, p. 35, pl. 9, fig. 2.
Clelia petolarius Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 138-139, pl. 17.

Four specimens are in the collection, as follows: Three specimens, a young adult, K.U.M.N.H. No. 31974, John Baker, coll., a juvenile specimen, No. 34833, collected by Mrs. Albert Weyer, and a large adult, No. 34899, taken by me, are from Golfito, Puntarenas Province; No. 34894 from La Lola, Limón Province.

The juvenile (red and black banded) male specimen, No. 34833, resembles in pattern the figure given by Taylor (*loc. cit.*); the body

bands are somewhat more numerous (34) while 20 can be discerned on the tail. Ventrals, 202; subcaudals, 102; anal single; scale formula, 19,19,19,17, with paired apical pits; supralabials, 8-8, infralabials, 10-10.

No. 31974 ♂ is a young adult that has lost all trace of the red banding. Ventrals, 226; subcaudals, 92; supralabials, 7-8; infralabials, 8-8; scale formula, 19,19,19,17. This specimen was captured at night in a low pasture.

No. 34894 is a large male specimen, taken at night on a golf course at the edge of a forest. Ventrals, 227; subcaudals, 94; supralabials, 7-7, third and fourth enter orbit; infralabials, 8-8, five touching first chinshields. Scale formula: 19, 19, 19, 17.

No. 34899 from La Lola is a gigantic specimen measuring 2,200 mm., the tail, 332+ mm. (mutilated). The ventrals are 244, subcaudals, 61+. Scale formula: 19,19,19,17. Supralabials, 7-7, the third and fourth entering orbit; infralabials, 8-8, five touching first chinshields. This specimen was captured in a clearing.

Erythrolamprus bizonus Jan

Erythrolamprus aesculapii bizona Jan, Arch. Zool. Anat. Fis.,* vol. 2, fasc. 2, 1863, pp. 314-315.

Erythrolamprus bizonus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 140.

The series of specimens belonging to this species are K.U.M.N.H. Nos. 30973-75, 31892, 31989-91, 34840, 34884-87 from I.A.I.A. Turrialba, except No. 31890, Las Flores, Tenorio, Las Cañas, Guanacaste; No. 31891, Tunnel Camp near Peralta, and No. 31889 from an unknown locality. A crushed specimen was taken at an elevation of approximately 5,000 ft. on the Pan-American Highway about 12 kilometers south of Cartago. This was not preserved.

Table of scale counts of *Erythrolamprus bizonus* Jan

Number	*Sex*	*Ventrals*	*Subcaudals*
30973	♂	198	53
39074	♀	195	48
39075	♂	195	56
31892	♀	194	52
31989	♂	199	58
34840	♀	193½	49
34884	♀	195	49
34885	♂	197½	55
34886	♂	196	57
34887	♀	196	47
31889	♂	199	58
31891	♂	194	57
31890	♂	195	60

* This publication referred to by Boulenger erroneously as Arch. Zool., Anat. Phys. and by Taylor as Arch. Anat. Zool. Phys. has caused considerable confusion on the part of a subsequent worker, and has unwittingly caused elaborate and laborious search for a nonexistent publication. See, Bull. Comp. Zool., vol. 87, Mar. 1941, p. 513.

Coniophanes fissidens punctigularis Cope

Fig. 22

Coniophanes punctigularis Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 12, 1860, p. 248 (type locality, Honduras).
Coniophanes fissidens punctigularis Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1951, pp. 142-143, pl. IV, fig. 1.

Five specimens, K.U.M.N.H. Nos. 30976-30979, and No. 34834 are from the farm of the Inter-American Institute of Agriculture, at

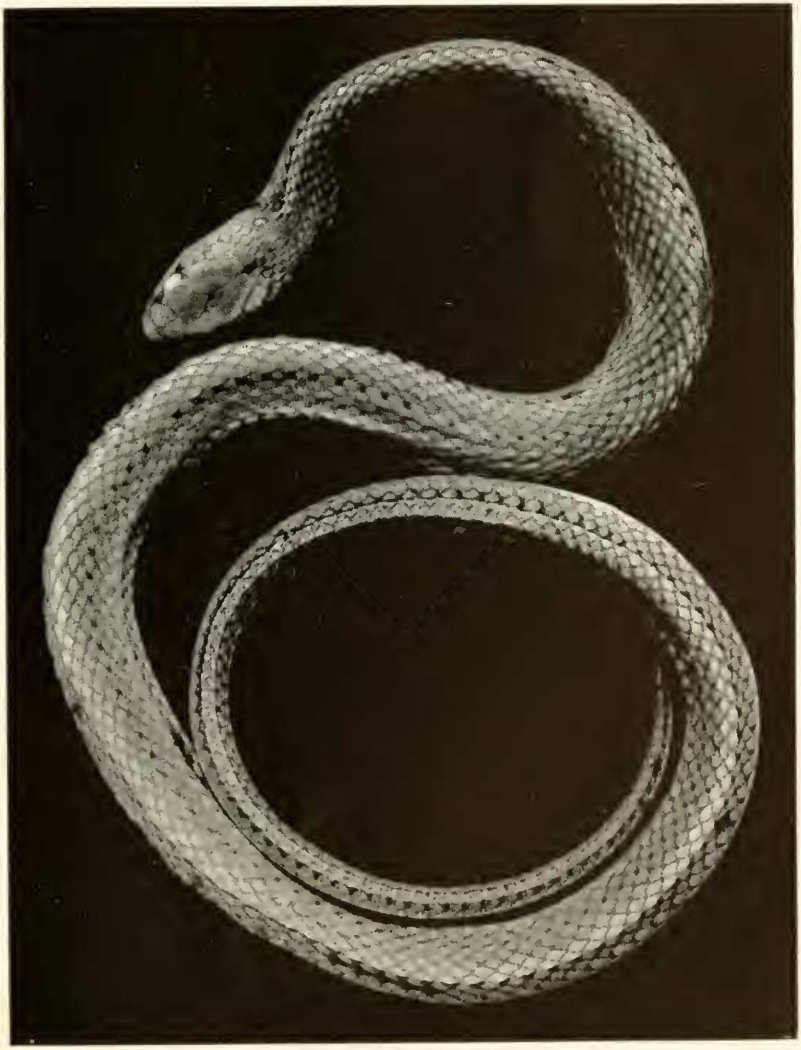

FIG. 22. *Coniophanes fissidens punctigularis* Cope. K.U.M.N.H. No. 34834; Turrialba, Costa Rica. (Enlarged, actual total length 335 mm.)

Turrialba and all conform in general to the characters of this species. The temporals are 1+2 (save one has the first temporal broken on one side) and there are two postoculars, one preocular, supralabials, 8-8, infralabials, 10-10. The scale formula is 21-21-17, the scales lacking pits and keels. The sex and ventral subcaudal counts where known are respectively as follows: ♂ 115, ?; ♂ 115, ?; ♂ 114, 73; ♀ 119, 65; ♂ 116, ?; anal divided in all.

Stenorrhina degenhardti degenhardti (Berthold)

Fig. 23

Calamaria degenhardtii Berthold, Abhand. Ges. Wiss. Göttingen, vol. 3, 1846, p. 8, pl. 1, fig. 2, 4 (type locality, Mexico and Central America. The northern form has been separated as *degenhardti mexicana*, the type locality restricted to Córdoba, Veracruz. The typical form is from Central America).
Stenorrhina degenhardtii degenhardtii Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 146-147 (Costa Rican specimens).

The specimen, K.U.M.N.H. No. 31931 that I am placing under this name, comes from the Pacific slope of Costa Rica at San Isidro del General. Previously known specimens have been from the east coast.

The dentition is somewhat reduced there being 10 maxillary teeth followed after an interval by an enlarged grooved fang. The prefrontal touches labials on one side only, a small loreal being present on the other side.

The specimen is light tan with 23, somewhat quadrangular, black or black-brown blotches on body (that on neck somewhat more elongated). On body, except on anterior part, smaller median spots intercalated between the larger; laterally two or three alternating rows of dashlike spots, more irregular on outer scale rows. The tail has five larger spots with numerous other small spots. Venter whitish, each scale with one to four black spots, many nearly triangular, tending to alternate but occasionally contiguous, darker under tail. The top of the head is light brown with five or seven small dark spots, more or less symmetrically arranged.

The following scale characters obtain: Scale formula (21-17)-17-17; supralabials, 7-7, the second and third entering eye; loreals, 1-0; infralabials, 7-7, three touching first chinshields; preocular, 1-1; postocular, 2-2; second chinshields small, barely in contact; ventrals, 166; anal divided; subcaudals, 35. Scales smooth without pits.

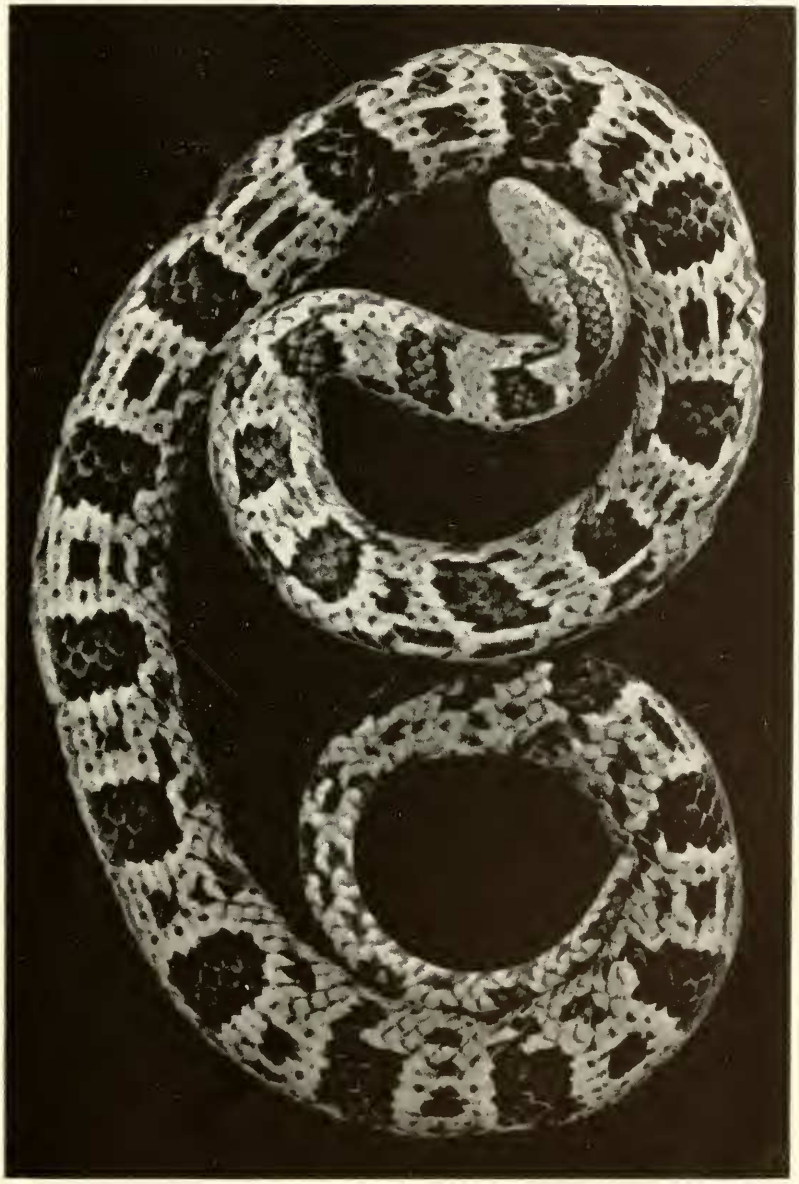

FIG. 23. *Stenorrhina degenhardti degenhardti* (Berthold). K.U.M.N.H. No. 31931; San Isidro del General, San José Prov., Costa Rica. (About natural size.)

Stenorrhina degenhardti subsp.?

Fig. 24

This specimen from Turrialba, Costa Rica, K.U.M.N.H. No. 31977, does not seem to agree with forms previously recognized from this region. I am uncertain as to its subspecific relationship.

The most striking characters separating it from the preceding snake are: (1) the internasals equally as long as prefrontals, fused to the anterior nasal; (2) the posterior nasal broadly in contact with the preocular, the loreal absent; (3) frontal as long as parietals; (4) dorsal and lateral color nearly uniform gray above, the

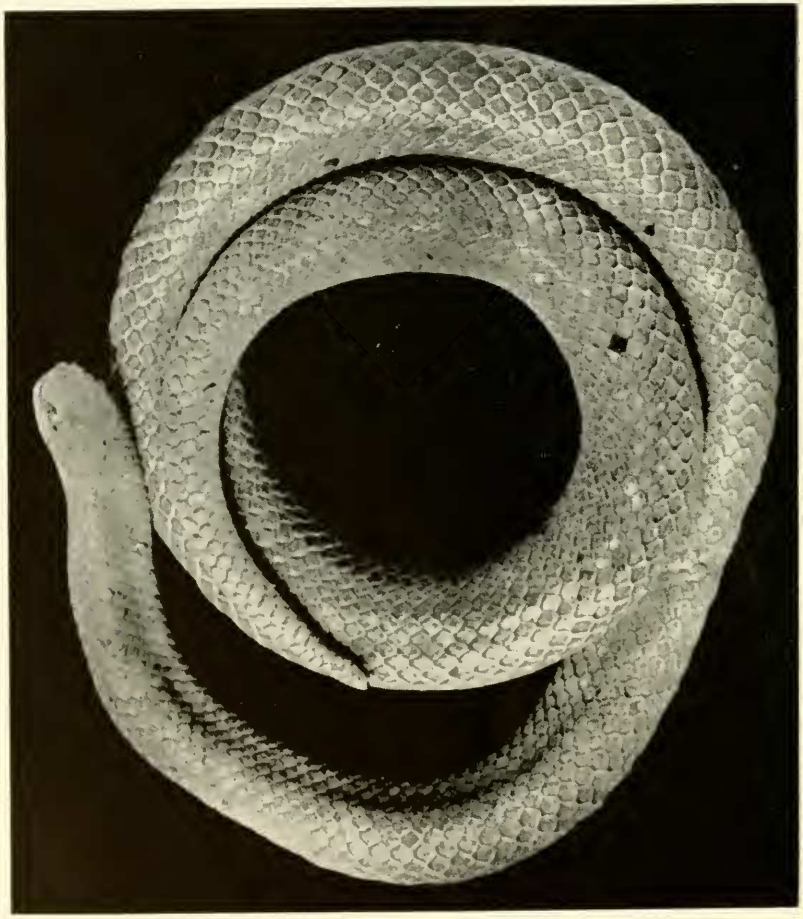

FIG. 24. *Stenorrhina degenhardti* subsp.? K.U.M.N.H. No. 31977; Turrialba, Costa Rica. (About natural size.)

individual scales showing some uniform variation in darker and lighter marks, with an occasional black scale present. (5) Chin white to first ventral. Anterior ventrals light with edges marked with transverse black lines, the line gradually widening on ventrals posteriorly; the pigment darkest and widest near the median line of the venter.

Ventrals 157; anal divided; 32 subcaudals; scales 17-17-17. (24 about back part of head.)

The specimen is a female containing numerous eggs. It is a gift from my friend Julio Valerio, who collected it at Turrialba.

Tantilla annulata Boettger

Tantilla annulata Boettger, Zool. Anz., 1892, p. 419 (type locality, Nicaragua); Taylor, Univ. Kansas, Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 149-152, pl. 18, (Costa Rican records).

Specimens of this snake in the collection are K.U.M.N.H. Nos. 30938, July 3, 1931; No. 30939, late August, both from Turrialba, Costa Rica, and No. 34832 from Golfito, collected by Mrs. Weyer.

Scale data on *Tantilla annulata*

Number	30938	30939	34832
Ventrals	147	147	148
Subcaudals	59	58	46–

Tantilla armillata Cope

Fig. 25

Tantilla armillatum Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 8, 1876 (1875), p. 143 (type locality, "middle Costa Rica"); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 152-153; Dunn and Bailey, Bull. Mus. Comp. Zool., Harvard College, vol. 86, no. 1, Oct., 1939, p. 19 (Caña, Panamá).

Homalocranium armillatum Günther, Biologia Centrali-Americana; Reptiles and Batrachians, Jan. 1895, p. 149, pl. 52, fig. C.

One specimen, K.U.M.N.H. No. 31960, was collected on the Dominical Road about 10 mi. WSW of San Isidro del General, July 10, 1952.

The pattern of squamation is in accord with the type in having the mental separated from the chinshields, the prefrontals touching the labials and separating the posterior nasal and preocular, and seven upper labials. Compared with Günther's figure (*loc. cit.*) the specimen at hand has a median dark line, the sixth and seventh scale rows being a little lighter than the fifth row which has a blackish edge both above and below anteriorly, but seemingly the three rows are identical posteriorly. The white line on the third and fourth rows presents a wavy appearance, as does the black

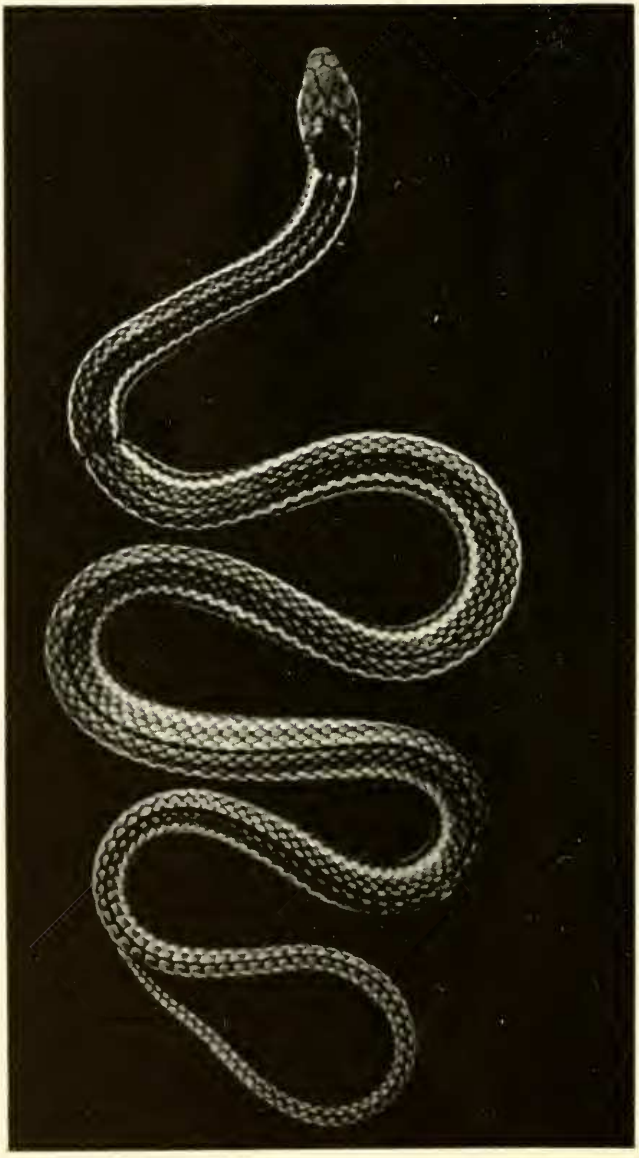

FIG. 25. *Tantilla armillata* Cope. K.U.M.N.H. No. 31960; 10 mi. WSW San Isidro del General, San José Prov., Costa Rica. (About natural size; actual total length, 292 mm.)

borders of the white line. The first scale row is light with a somewhat diagonal black line anteriorly, a dimmer longitudinal line posteriorly, the pigment encroaching on the ventrals. The deep black of rows two and three becomes much lighter posteriorly. The top of the head is brownish with spots on the back of the parietals; laterally the labials in front of the eye are ivory save for small dark marks on the upper edges of the second, third, and fourth labials and small sutural marks between the last three; an irregular dark line runs back from eye to the dark nuchal area crossing first temporal and upper part of seventh labial. The venter is white becoming bluish white under the subcaudal region where there is some pigment along the middle line. The chin is white, the infralabials bearing darker spots, or lines, along the sutures, the mental being largely dark.

The temporals are 1+1. The second temporal alone touches the first but posterior to the seventh labial is a second temporal. In this it agrees with the type specimen.

The general pattern of the collar does not fit the type description or the one figured by Günther (which may or may not be from Costa Rica). The two specimens listed by me (*loc. cit.*) likewise show some variation. It is doubtful that the variations are worthy of nomenclatorial recognition.

The ventral and subcaudal counts are low, 148, 67 with a total of 215 ♂. (The type has 166, 50; total 216 ♀ ?; Harvard No. 15285, 174 ventrals, ?; U.S.N.M. No. 9787, 169, 47, total 216.)

Tantilla shistosa (Bocourt)

Homalocranium shistosum Bocourt, Mission Scientifique au Mexique et dans l' Amérique Central. Études sur les reptiles, livr. 9, 1883, p. 584, pl. 36, figs. 10, 10a-10c (type locality restricted to Alta Verapaz [by Stuart, 1948]; Dunn and Bailey, Bull. Mus. Comp. Zool. Harvard College, vol. 86, no. 1, Oct. 1939, p. 19 (Canal Zone); Taylor, Univ. Kansas Sci. Bull., vol. 34, pl. 1, no. 1, Oct. 1, 1951, p. 155.

The specimens in the collection are, K.U.M.N.H. Nos. 34039-34041, Cinchona (Isla Bonita) Costa Rica; 34042, I.A.I.A. Turrialba.

Scale data on *Tantilla shistosa*

No.	34039	34040	34041	34042
Ventrals	149	147	150	141
Subcaudals	33	39	35	34
Totals	182	186	185	175

The three younger specimens No. 34039-34041 are brown above with a yellowish neck band and without spots on sides of head. Belly anteriorly maroon becoming pinkish red to tip. No. 34042 is coral pink below.

Dunn and Bailey report a specimen from the Canal Zone having 132 ventrals and 34 subcaudals, total 166.

Tantilla costaricensis sp. nov.

Fig. 25a

Type: K.U.M.N.H. No. 30995, Cervantes, Cartago Province, Costa Rica, elevation about 4,200 ft., Aug. 30, 1951, Edward H. Taylor, collector.

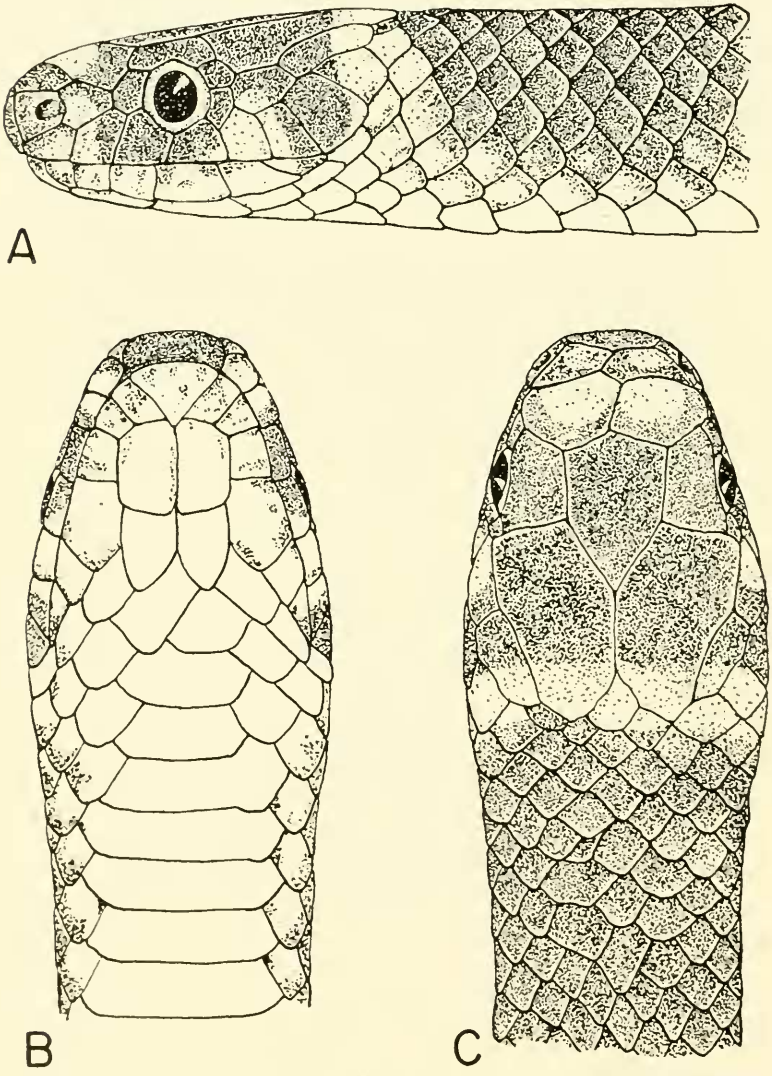

FIG. 25a. *Tantilla costaricensis* sp. nov. Type, K.U.M.N.H. No. 30995, Cervantes, Costa Rica. (× 5.)

Diagnosis: Related to *Tantilla shistosa* but more robust with a longer frontal, (distinctly longer than its distance from tip of snout); head black, with a pair of rather large brownish spots on prefrontals; a white spot involving part of first two labials and posterior nasal; a large salmon spot covering parts of first temporal and the fifth and sixth labials; scales of first and second scale rows with ivory-white centers anteriorly, the white disappearing after a short distance. Chin and throat ivory; venter and under tail deep salmon; four labials touching first chinshields; a nuchal band present. Dorsally brown, the scale centers somewhat lighter.

Description of type: Part of rostral narrowly visible above, not angular, equal to the width of the internasals; latter narrow, twice as wide as their length; length of prefrontals twice (or a little more) length of internasals, much wider than long, angular on the side, narrowly separated from second labial; frontal pointed behind, its length one-fourth greater than its distance from tip of snout; supraoculars short, about a fourth longer than wide; length of parietal equal to its distance from tip of snout; nasal undivided more than twice as long as high, touching preocular narrowly; preocular higher than wide, not reaching top of head; two postoculars; anterior temporal about a fourth longer than high, followed by an elongate secondary temporal more than twice as long as high, and with the lower secondary temporal below its posterior part, separated from the anterior; seven supralabials, the third and fourth entering eye, the third very narrowly in contact with the preocular; six infralabials, the first four touching the first chinshields. Mental large, equal in width to rostral, touching chinshields; first pair of chinshields much longer and somewhat wider than second pair; scales smooth, the formula: 15-15-15; ventrals, 145; anal divided; subcaudals, 18+ (the tip of tail missing).

Color: Above brown, the scales darker edged; head black with two light spots on prefrontals, and a narrow light band across back of parietals and nape of neck; a yellowish spot below and partly behind nostril, and another on the lip behind eye that is rather salmon in color. A row of light spots on scales of the anterior part of the first scale row, a few also on second row. Chin and neck white or ivory white, with slight pigmentation on infralabials and mental; becoming deep salmon on remainder of venter and tail. Ventrals narrowly edged with brown.

Measurements in mm.: Snout to vent, 262; tail, 28+ (mutilated) width of head, 6.8; length of head, 9.2.

Remarks: This species seemingly is related to the *Tantilla shistosa.* The latter species maintains a color pattern which lacks lateral head markings with considerable constancy. It is known to range from Alta Verapaz, Guatemala to Panamá.

Dipsas anthracops (Cope)

Fig. 26

Leptognathus anthracops Cope, Proc. Acad. Nat. Sci. Philadelphia, 1868, pp. 108, 136 (type locality, Central America).
Dipsas anthracops Taylor, Univ. Kansas Sci. Bull., vol. 35, pt. 1, no. 1, Oct. 1, 1951, pp. 58-59.
? *Sibynomorphus ruthveni* Barbour and Dunn, Proc. Biol. Soc. Washington, vol. 34, 1921, p. 158 (type locality, Aguacate Mountains, Costa Rica).

A female specimen of this snake, K.U.M.N.H. No. 31893, was obtained at Tenorio, Guanacaste, Costa Rica, under a loose piece of bark on the trunk of a living tree at about 12 feet above the ground.

The color (in life) of the head is black with the greater part of the chin, lower labials, and posterior upper labials white; the temporal region is yellow and nape of neck pink. Body black above with three transverse rings on the neck yellow, the other rings on body and tail brick red, edged with cream yellow; below, the bands are cream white, the dark bands gray-black.

The reddish bands on the body and tail have numerous elongate black flecks and a small blackish spot on outer scale row sometimes extending onto the ventrals; the black bands are somewhat irregular, only an occasional one actually connected on venter; twenty light bands on body, 12 on tail, the anterior ones separated by black spots as long as ten or eleven scale-lengths, and posteriorly by as few as four scale-lengths.

The scale characters are: rostral wider than high, visible above as a line; internasals wider than long; prefrontals large, wider than long entering eye; frontal longer than its distance from tip of snout; parietal length equals distance of parietal from internasal; nasal divided; loreal about one and one-third times as long as high; no preocular, two postoculars; temporals, 1+2+3; supralabials, 7-7, the three anterior high; fourth and fifth entering orbit; infralabials, 9-8, six or five bordering the first pair of chinshields; latter longer and slenderer than second pair of chinshields; third pair wider than long; the first labials are widened at their common suture (as if a small pair of chinshields had fused with them); eye large, its diameter equal to length of snout. No apical pits visible; scale formula 20 (around back of head), 13, 13, 13, 15 (the latter

FIG. 26. *Dipsas anthracops* (Cope). K.U.M.N.H. No. 31893; Tenorio, Las Cañas, Guanacaste, Costa Rica. (About natural size; actual total length, 371 mm.)

count just in front of vent). Ventrals, 175; anal single; subcaudals, 76; total length, 371.3 mm., tail, 88.9 mm.

The differences between this form and *ruthveni* is indeed slight. The loreal is relatively longer in proportion to its height and the color may be different. The red color fades quickly and is gone completely after two to three weeks in preservative (formalin and alcohol).

Dipsas annulata (Günther)

Fig. 27

Leptognathus annulatus Günther, Ann. Mag. Nat. Hist., Ser. 4, vol. 9, 1872, p. 30, (type locality, Cartago, Costa Rica).
Dipsas annulata Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 61-62, pl. 3, fig. 1. (Costa Rican specimen described).

A specimen of this rare snake was discovered at night in plants (*caña brava*) about 14 feet from the ground on the edge of a stream

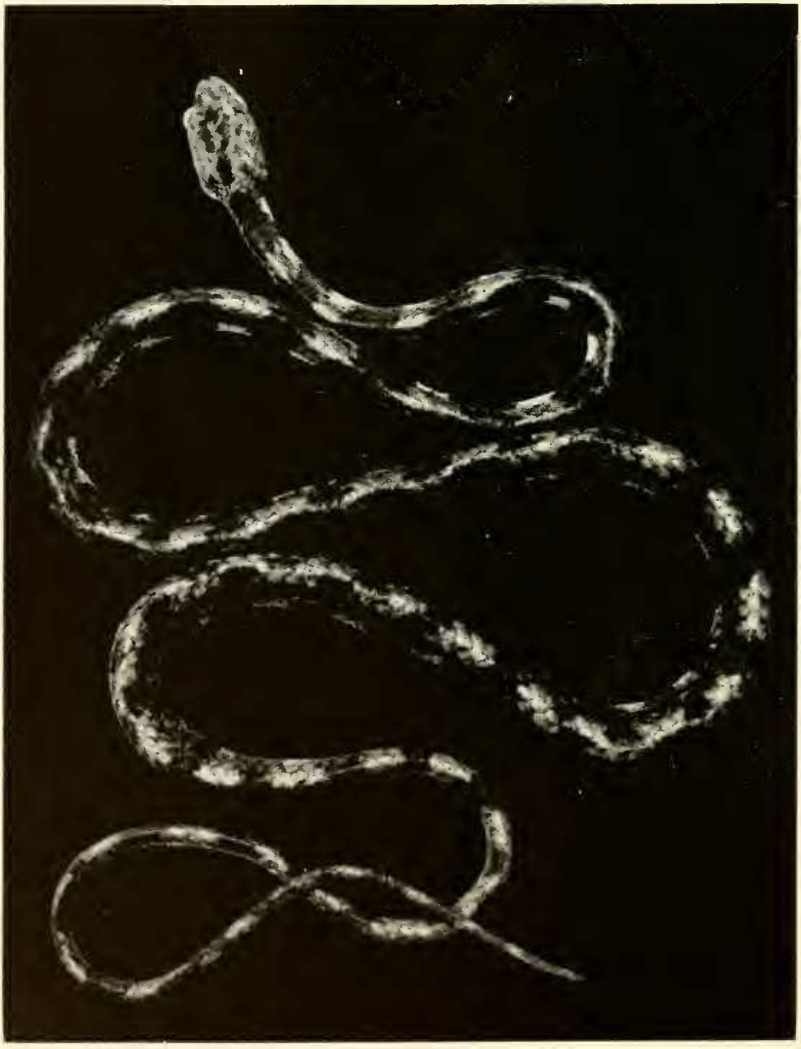

FIG. 27. *Dipsas annulata* (Günther) K.U.M.N.H. No. 31950; Moravia de Chirripo, Limón Prov., Costa Rica. (About natural size.)

at Moravia de Chirripo by John Baker (K.U.M.N.H. No. 31950). The elevation of this point is approximately 580 m. It agrees in most details of squamation with the specimen described from Isla Bonita by me (*loc. cit.*) as well as with the type.

The species has the snout narrowed in front of the eyes, and the sides of the snout are nearly perpendicular to lip. The median dorsal row of scales is enlarged, as are the two adjoining rows and only slightly smaller than the median.

In No. 31950 the ventrals are 166, the subcaudals, 107+ (a small terminal part of tail missing). The anal is single.

The following characters obtain: supralabials, 7-7, the fourth and fifth entering orbit; infralabials, 9-9, two touching the first small pair of chinshields, five touching second enlarged pair; large chinshield of second pair on left side is diagonally severed; third and fourth pairs of chinshields wider than second pair; first labials do not meet behind mental. There are about 19 scale rows on back part of head but elsewhere on body there are 15 rows; eye large its diameter equal to length of snout; maxillary teeth 15, smallest anteriorly and posteriorly; teeth present on pterygoids. The banding is less sharply marked, the intervening lighter areas are pigmented so that the bands seem to be broken laterally. On the venter, the lighter areas are also strongly peppered with brown pigment. The intervening dark areas are broken on venter, only a few forming complete bands; approximately 34 light bands on body and twenty on tail; head lighter with some subsymmetrical dark spots; six dark spots on chin.

The colors are practically the same as in the Isla Bonita specimen described and figured by me (*loc. cit.*).

Dipsas tenuissima sp. nov.

Figs. 28, 29

Type: K.U.M.N.H. No. 31961, approximately 15 km. WSW San Isidro del General, on Dominical Road, in swamp. July 10, 1952; Edward H. Taylor, collector.

Diagnosis: A very slender snake with compressed body, the head much wider than neck; diameter of eye a little less than length of snout; only two pairs of chinshields, first pair separated from mental; nasal partly divided; two preoculars and one loreal enter orbit, the prefrontal being excluded; three postoculars; temporals, 2+3+3. Ventral-subcaudal count, above 300; supralabials, 8-8; infralabials, 9-9. Scale formula, 15-15-15; median scales enlarged, all without keels or pits; 20-21 teeth on maxillary.

Description of the type: Rostral almost twice as wide as high, visible above as a line; internasals relatively large, distinctly wider than long; prefrontals distinctly wider than long, not entering orbit; frontal somewhat triangular in shape, minutely longer than broad, its length equal to or slightly greater than its distance from tip of snout; supraoculars rather small, forming a right angle on inner side; parietals longer than broad, their length less than their distance from internasals; nasal longer than high, with an entrant

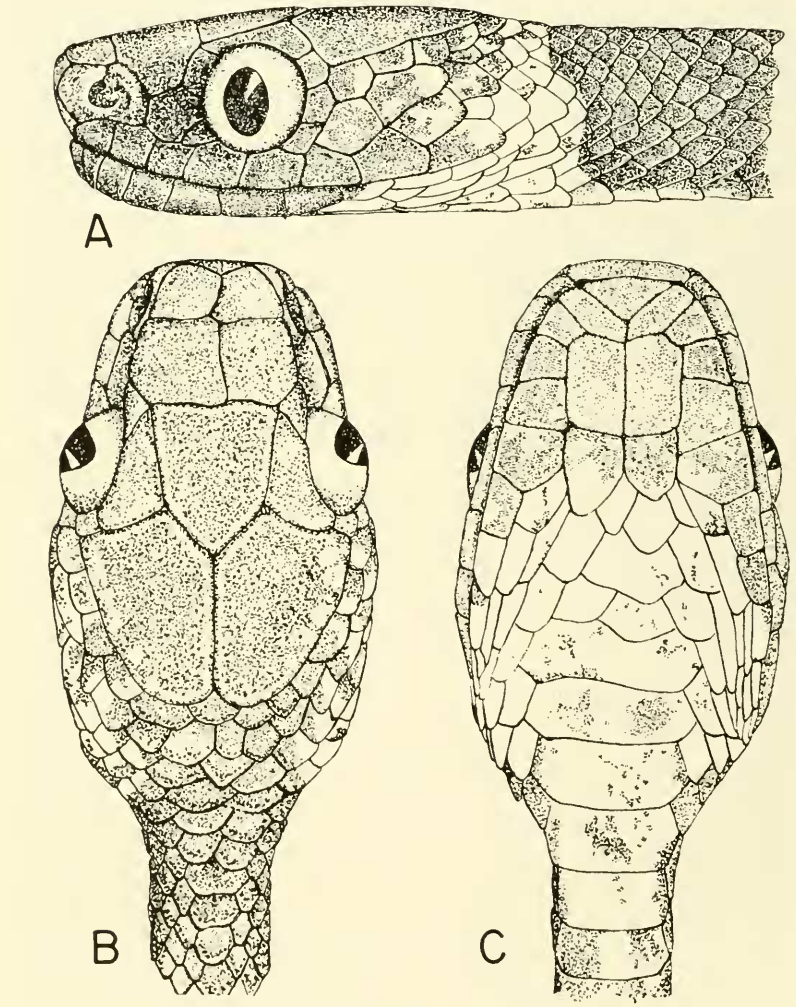

FIG. 28. *Dipsas tenuissima* sp. nov. Type. K.U.M.N.H. No. 31961; 15 km. WSW San Isidro del General, San José Prov., Costa Rica. (× 5.)

suture from internasal to nostril; back rim of nasal scale elevated, with a preceding depression; loreal as high as wide, entering orbit between a large upper and small lower preocular, the upper preocular reaching frontal at a point; eight upper labials, all relatively low, the fourth and fifth entering orbit; three postoculars, the uppermost largest; each anterior temporal touches two postoculars;

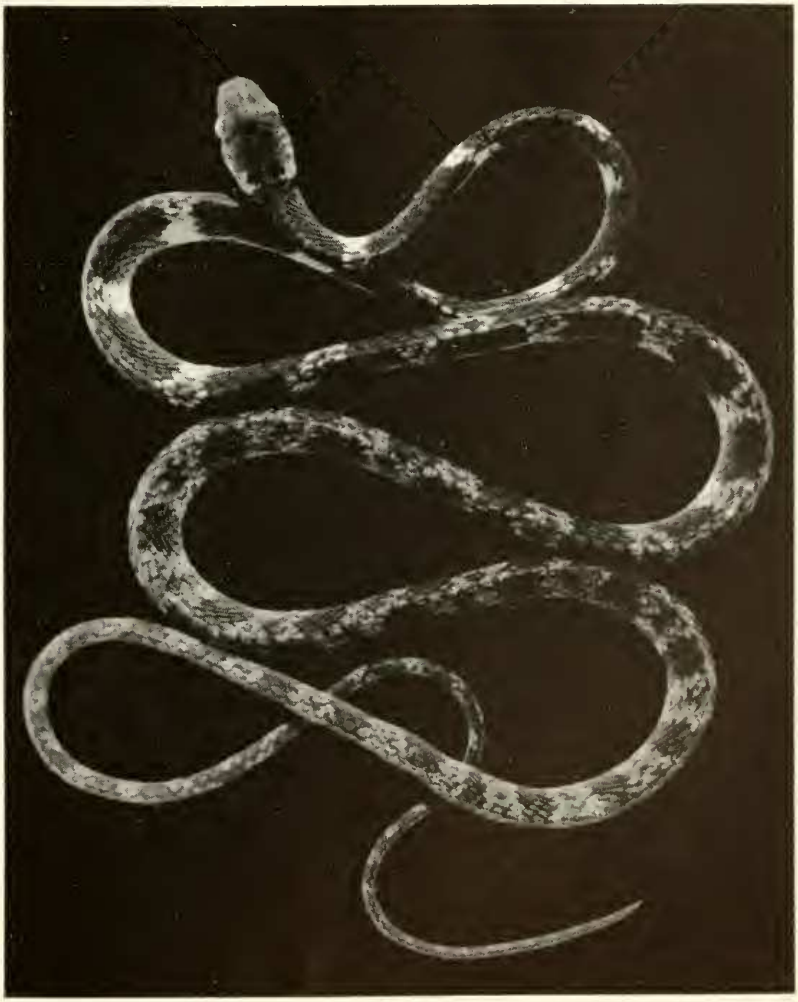

FIG. 29. *Dipsas tenuissima* sp. nov. Type. K.U.M.N.H. No. 31961; 15 km. WSW San Isidro del General, San José Prov., Costa Rica. (Somewhat enlarged; total length, 555 mm.)

temporal formula, 2+3+3; eight infralabials, the first pair forming a median suture, four touching anterior chinshields; latter scales rather truncate anteriorly and posteriorly, not twice as long as wide; second pair smaller in contact.

Scales without keels or paired apical pits, but with microscopic striations; scales about head 19-20 at neck, middle of body, and in front of vent the count is 15. The scales are narrow, pointed, except the median, which is enlarged.

Ventrals, 225; anal single; subcaudals, 128.

Measurements in mm.: Snout to vent, 390; tail length, 165; total length, 555; width of head, 7; length of head to jaw angle, 12.

Micrurus mipartitus multifasciatus (Jan)

Elaps multifasciata Jan, Rev. Mag. Zool., 1858, p. 521 (type locality, Central America).
Micrurus mipartitus multifasciata Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 158-159, pl. 19.

Two juveniles of this species were captured at Turrialba, Costa Rica, one, No. 31884, on the farm of the Inter-American Institute of Agriculture, the other, No. 31885, in the edge of the town, at Finca Dominica, crawling across the road.

The former has 58 black bands on body, three on the tail; the latter has 63, with four on the tail. This latter specimen has a discrete black spot on the parietals that is absent in the former. The ventrals are 260, subcaudals, 28; 276½ and 29, respectively.

Micrurus nigrocinctus nigrocinctus (Girard)

Elaps nigrocinctus Girard, Proc. Acad. Nat. Sci. Philadelphia, 1854, p. 226; U. S. Naval and Astronomical Expedition, vol. 2, Zoology; 1855, p. 210, pl. 34 (type locality Taboga Island, Bay of Panamá.)
Micrurus nigrocinctus nigrocinctus, Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 160-162, pl. 20.

Two specimens taken in the same area on the road to Dominical, approximately 15 miles WSW of San Isidro del General are referred to this subspecies. (K.U.M.N.H. Nos. 31880, 31881).

These agree generally with the specimen figured by me (*loc. cit.*) and agree also in having several subcaudals undivided; but both have a greater amount of pigmentation on the venter. They have respectively, 16 body, five tail bands, and 15 body and five tail bands; ventrals, 190, subcaudals, 47, the second to eleventh undivided; ventrals 190, subcaudals 47, the third to twelfth undivided.

Micrurus nigrocinctus mosquitensis Schmidt

Micrurus nigrocinctus mosquitensis Schmidt, Zool. Ser. Field Mus. Nat. Hist., vol. 20, 1933, p. 33 (type locality Limón, Costa Rica); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 164-165, pl. 21, text fig. 5.

Numerous specimens of this subspecies are present in the collection. These are K.U.M.N.H. Nos. 30964-30972, 31877-31879, from Turrialba, Costa Rica. Most of these were taken on the farm of the Inter-American Institute of Agriculture.

Older specimens show a greater amount of dark coloring on the red scales and sometimes this may form rather large blotches on the venter.

Most of the specimens have the nuchal black band connecting by a black stripe, with the dark area on the tip of the chin. I found in two specimens a single undivided subcaudal.

Micrurus nigrocinctus alleni Schmidt

Fig. 30

Micrurus nigrocinctus alleni Schmidt, Zool. Ser. Field Mus. Nat. Hist., vol. 20, no. 30, Oct. 31, 1936, pp. 209-211, fig. 25 (type locality Río Mico, 7 mi. above Rama, Siquia District, Nicaragua).

A male specimen of a coral snake, K.U.M.N.H. No. 31886, taken at Los Diamantes, near Guápiles, in the immediate vicinity where two other forms, *Micrurus nigrocinctus mosquitensis* and *Micrurus richardi* Taylor have been taken, is referred to this subspecies.

The specimen has 17 black bands on body, each bordered by two scale rows of ivory yellow and these groups separated by coral red bands of varying width but usually wider than the black bands. The tail has six black bands separated by bands of ivory yellow, three or four scales wide, the edges of the scales outlined in light brown. Where the black and yellow bands meet on the back the black and yellow scales often interdigitate.

The black of the anterior part of the head extends over the snout and the whole of the frontal, with a slight dark line on the adjoining parts of the parietals. The head band of yellow, covers the occiput and the equivalent of one scale-row behind the parietals. Here the dorsal scales are outlined partially in light brown. The black does not pass behind the eye, the two postoculars being light brown and the outer parts of the anterior infralabials being black. Below the posterior yellow supralabials as well as below the posterior infralabials there are gray areas. These seem to be due to pigmentation *below* the scales.

The red areas above have small but distinct black spots on each scale while on the ventrals the black flecks are scattered.

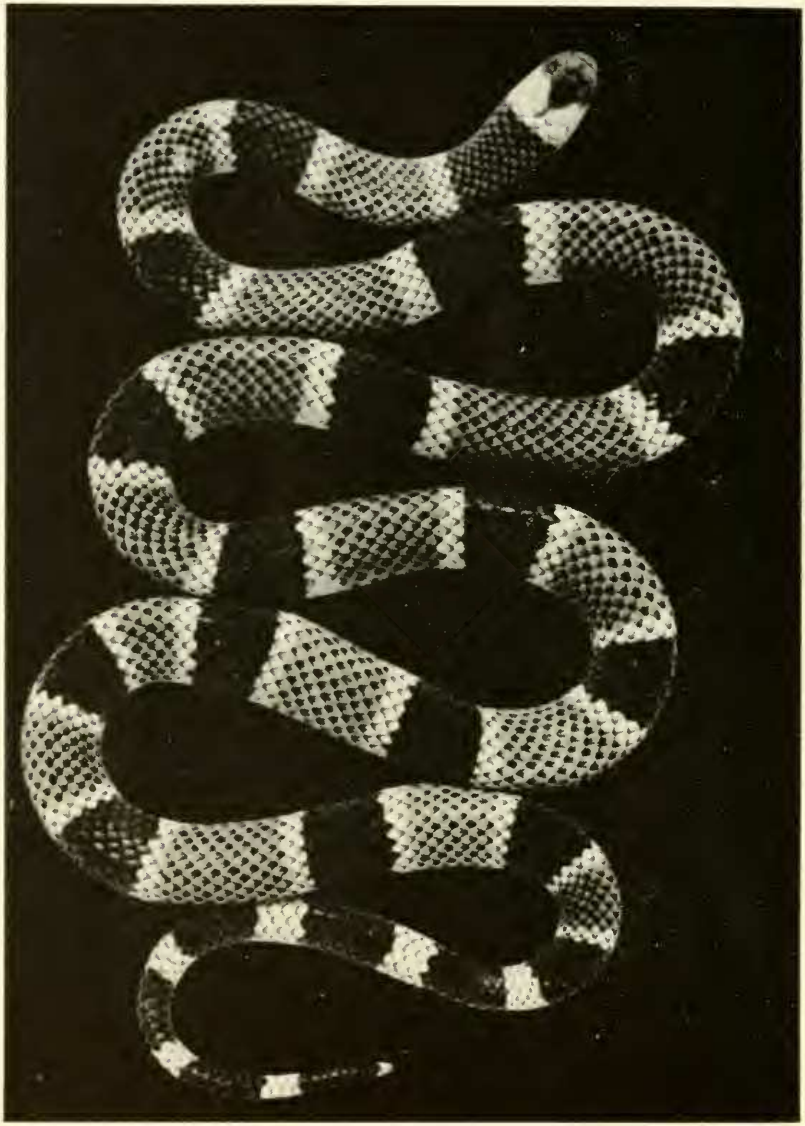

FIG. 30. *Micrurus nigrocinctus alleni* Schmidt. K.U.M.N.H. No. 31886; Los Diamantes, Limón Prov., Costa Rica. (About natural size.)

The ventrals are 224, the subcaudals 56, the anal divided. The scale formula is (17,15),15,15, the scales generally smooth, without "apical pits," those beside vent with keels or rounded knobs.

The number of scales between the black bands are 10-10-13-14-13-10-9-8½-8½-7½-9½-7-5-7½-9½-5. This species has somewhat the

general appearance of *richardi* which has 18 black bands on body, 4 on tail. The width of the red and yellow bands together from neck to tail, measured in scale-lengths, are: 17-13-11½-10½-10½-10-10-10-9-9½-9½-9½-10½-10-10-10-10. In *richardi* the head band includes two scale rows. The individual scales on the body are distinctly longer and more acuminate. The parietals are distinctly longer and pointed posteriorly nearly equal to their distance from the rostral. In the species before me the parietals barely reach the internasals. In the type of *richardi* the red of the ventrals have no pigment whatever.

It is possible that certain writers have been too conservative in referring so many forms to subspecific status under the species *M. nigrocinctus*. On the Dominical Road in the Pacific drainage two forms were taken in the same field, *n. nigrocinctus* and *n. yatesi*. At Los Diamantes there are two subspecies occurring, seemingly occupying the same type of terrain, together with a third form which I believe I wrongly associated with *alleni* as a subspecies. Having obtained a specimen of *alleni*, I do not now believe *richardi* stands in subspecific relation to it, but regard *Micrurus richardi* as specifically distinct. Whether *alleni* should remain as a subspecies of *nigrocinctus* or not I cannot say; but the occurrence of this with *mosquitensis* at Los Diamantes argues against their being conspecific. No intergradation is indicated.

Micrurus nigrocinctus yatesi Dunn

Fig. 31

Micrurus nigrocinctus yatesi Dunn. Notulae naturae, no. 108, 1942, p. 8 (type locality, Farm Two, Chiriquí Land Company, near Puerto Armuelles, Chiriquí, Panamá).

A specimen of a coral snake, K.U.M.N.H. No. 31887, from a point on the road to Dominical approximately 15 miles WSW from San Isidro del General, Costa Rica, seems to differ from *Micrurus nigrocinctus nigrocinctus* as does the type of *yatesi*. The specimen has twenty black bands on body (including neck band and four on the tail). The red bands above as well as the yellow bands that separate them from the black bands are largely covered with black so that only a small part of each scale (about one sixth) shows the red or yellow color. Low on the sides and on the ventral surfaces the red is more evident. Each red ventral has a series of black spots often contiguous but obscuring a half or less of the surface; posteriorly the ventral spots are fewer. While there is no red evident either above or below on the tail, in the yellow areas the scales have from one half to two thirds of their surfaces blackened while

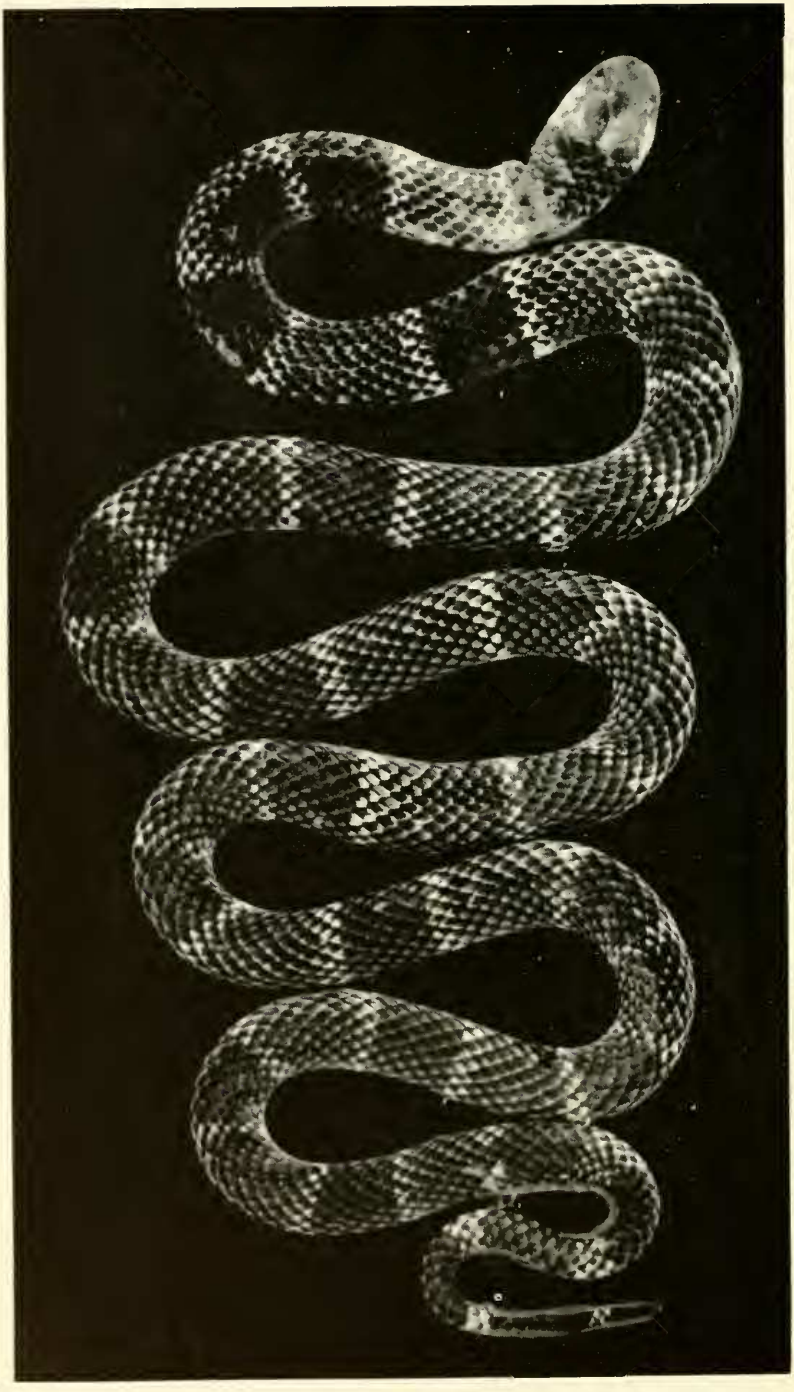

Fig. 31. *Micrurus nigrocinctus yatesi* Dunn. K.U.M.N.H. No. 31887; 15 miles WSW San Isidro del General, San José Prov., Costa Rica.

below they have no or only an occasional black fleck. The head band is almost completely obscured above, with an ivory spot covering the lower parts of the temporals and parts of the last three labials. The mental and the major part of the first three labials are black. Chin ivory with some black flecks.

The ventral count is 225; subcaudals, 38. Total length, 664 mm.; tail, 73 mm.

The wisdom of distinguishing a species or a subspecies on the basis of severed heads is to be questioned. If I have correctly identified this snake with *yatesi* it would appear that the two forms, *yatesi* and *nigrocinctus*, occur in the same locality.

Micrurus pachecoi Taylor

Micrurus pachecoi Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 165-168, pl. 22, text fig. 6, (type locality, Guanacaste, Costa Rica).

Two specimens of this species were taken at Tenorio, Guanacaste, K.U.M.N.H. Nos. 31882, 31883, and No. 31888 obtained from Sr. Alfonso Trejos is of unknown provenance in Costa Rica. The first specimen was found dead, with a section of the body, of unknown dimensions, missing. It is a male of somewhat smaller size but agreeing with the type in most characters. There are 52 subcaudals. Immediately behind the vent the tail is narrowed, then widens a half inch back of the vent. There are five black bands on the tail. The supraoculars are relatively wide, the white band on the head does not reach the back of the parietals, and there is a pair of darker spots on the parietals. Five black bands are on the tail. The ventrals, colored red and yellow, only occasionally have darker flecks.

The second specimen (No. 31883) a male, and distinctly younger than the preceding, has the head markings the same, save that the parietal spots are only barely suggested. The scales of the red and yellow bands are lightly and rather evenly pigmented. There are 17 black bands on body (the female type has 22) and 7 black bands on the tail (five in the female type). In neither case is there red on the tail.

There is, however, one rather striking variation in squamation in the second male. The preocular and posterior nasal are separated, permitting the prefrontal to touch the third labial.

The absence of the darker points on the red scales in this specimen is due, I believe, to youth, since in certain other forms this change in amount of dark pigmentation is ontogenetic.

The ventrals are 206; subcaudals, 58; anal, as well as the third

and fourth subcaudals divided. The tail seemingly has a rather sharp medial ridge throughout most of its length. This is a little less distinct in the other male, and seemingly not indicated in the female. The scales on the sides above the vent are keeled or with small rounded knobs.

A third Costa Rican specimen of unknown provenance was presented to me by Sr. Alfonso Trejos of the Hospital San Juan de Diós. This specimen agrees with the preceding in most characters. It is a female with 18 body bands, and four bands on the tail.

My specimens were found or captured in open grassy areas near patches of woodland.

Bothrops atrox asper (Garman)

Fig. 32

Trigonocephalus asper Garman, Bull. Mus. Comp. Zool., vol. 8, 1883, p. 124 (type locality, Obispo, on the Isthmus of Darién, Panamá, Dr. Maack, coll.).
Bothrops atrox atrox Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 179-180.

Specimens of this species have been acquired from both the Pacific and Caribbean drainages. The following numbers are in the collection: Nos. 34007, from an unknown Costa Rican locality; Nos. 34008-34011, Tenorio, Las Cañas, Guanacaste; Nos. 30963, 30999, 34888, Turrialba.

Scale data on *Bothrops atrox asper*

	Number	*Sex*	*Ventrals*	*Subcaudals (divided)*	*Scale formula*
	34007	♀	188	63	27-25-27-27-23-21
	34008	♂	197	68	27-25-27-27-23-21
Tenorio	34009	♂	197	69	27-25-25-25-19
	34010	♂	199	68	27-25-25-23-19
	34011	♀	199	61	27-25-25-23-21
	30963	♂	190	74	27-23-23-25-23-19
Turrialba	30999	♂	198	66 +	27-25-23-25-23-19
	34888	♀	193	66	27-25-25-25-23-19

Bothrops nummifer nummifer (Rüppell)

Fig. 33

Atropos nummifer Rüppell, Verz. Mus. Senck., Amph., 1845, p. 21 (type locality, Teapa, Mexico).
Bothrops nummifer nummifer Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 181.

A young specimen of this species K.U.M.N.H. No. 30959 was collected at the Inter-American Institute of Agriculture, Turrialba, Aug. 31, 1951.

The specimen agrees rather closely with a large adult obtained in 1947 at the same locality. The following characters obtain:

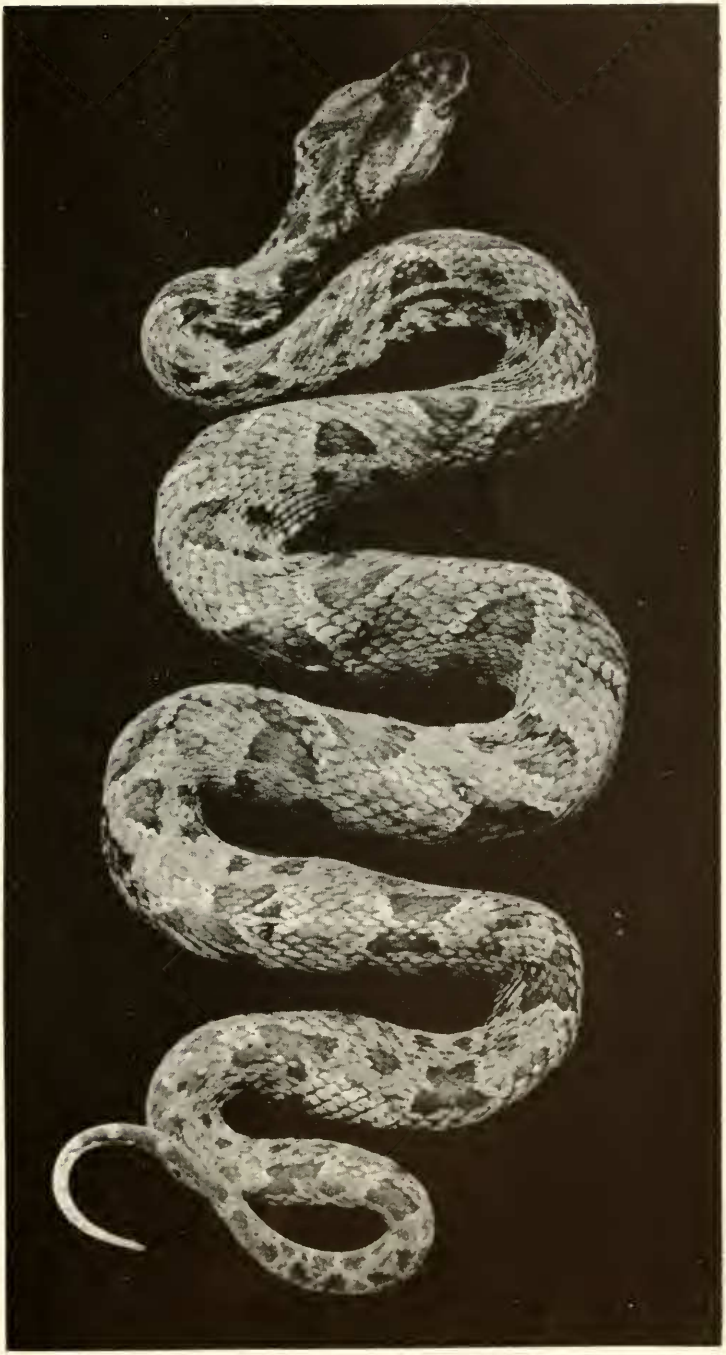

FIG. 32. *Bothrops atrox asper* (Garman) K.U.M.N.H. No. 34009; Las Flores, Tenorio, Costa Rica. (Actual total length, 842 mm.)

rostral separated from nasal by one or two scale rows; nasal divided, the anterior part broken into two scales on one side; on one side, supraocular enlarged; on one side subocular elongate, but broken into two or three scales on the other side; supralabials, 10-10, separated from subocular by three scale rows, from scales surrounding the facial pit by two or three rows; infralabials, 12-12, three touching the anterior chinshields. Scale formula: 31-25-21-19; ventrals, 123;

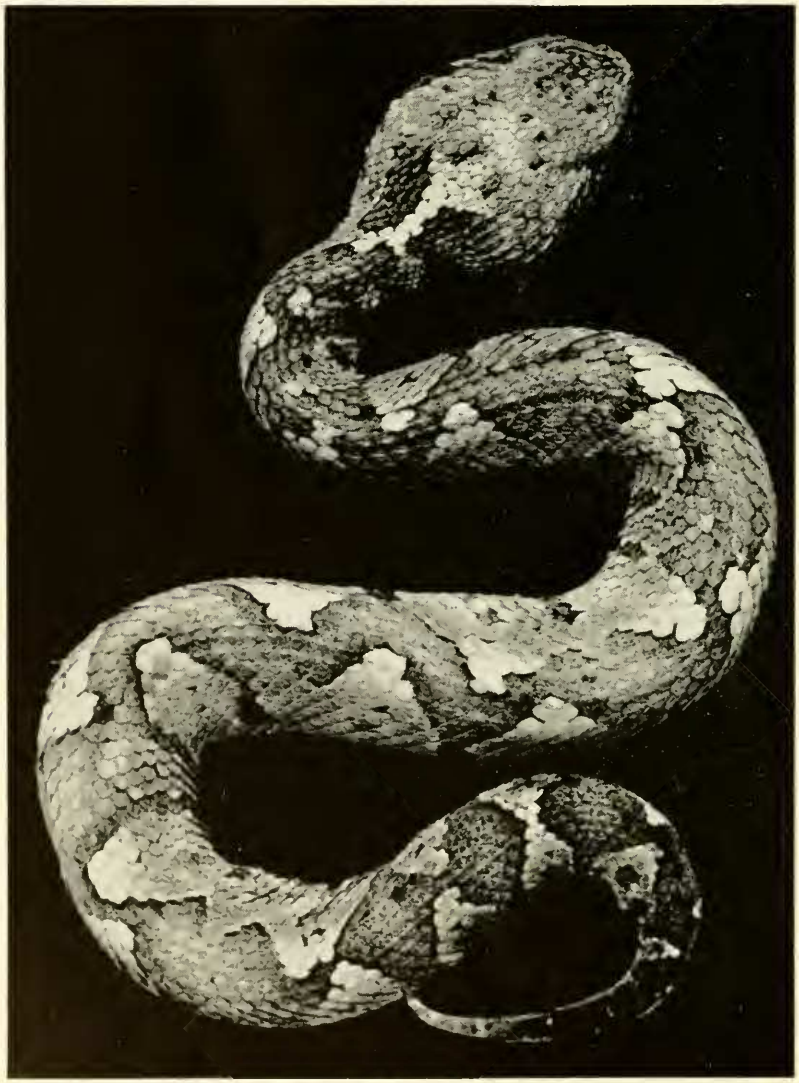

FIG. 33. *Bothrops nummifer nummifer* (Rüppell) K.U.M.N.H. No. 30959. Turrialba, Costa Rica. (Actual total length, 385 mm.)

subcaudals, 34, the first, and subcaudals numbers 27, 28, 30-33 divided; total length, 390 mm.; tail, 48 mm.; head width, 28 mm.; length, 31 mm.

Bothrops picadoi (Dunn)

Trimeresurus nummifer picadoi Dunn, Proc. Biol. Soc. Washington, vol. 52, 1939, pp. 165-168, La Palma, Costa Rica.
Bothrops picadoi Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 180-181.

I obtained a specimen of this large species at Turrialba. It is, I believe, the point of lowest elevation at which the species has been taken (624 m.). Its length is 1,040 mm., the tail 104 mm.

The following data obtain: ventrals, 150; subcaudals, 36, none divided; anal single; 10-10 supralabials; 13-12 infralabials, three touching first chinshields; the scale formula is 31-27-25-25-23-21; supraoculars elongate, slender, with ten scales between them; no scales between rostral and nasal.

Bothrops nasutus Bocourt

Fig. 34

Bothrops nasutus Bocourt, Ann. Sci. Nat., ser. 5, vol. 10, 1868, p. 202 (type locality, Pansas, bank of Polochic, Guatemala); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 177-178.

The species was found to be common in the general region about Turrialba, chiefly on the farm of the Inter-American Institute of Agriculture. Specimens are usually terrestrial but are sometimes found in low coffee bushes. Taylor (*loc. cit.*) states that the "body is slender." This may be true of males but the females are thick and all are relatively short. The largest one of my 14 specimens measures, total length, 485 mm.; tail, 52 mm. The specimen figured, from an unknown locality in Costa Rica has the labials and nasals separated by a row of scales. In one Turrialba specimen the first labial is separated on one side only.

All numbers listed are from Turrialba except No. 34005, La Lola, and No. 34636 of unknown provenance.

Table of scale counts of *Bothrops nasutus*

Number	*Sex*	*Ventrals*	*Subcaudals*
30982	♂	141	34
30983	♂	141	34
30984	♀	140	
30985	♂	137	35
30986	♀	138	29
30987	♂	140	36
34005	♂	139	33
34635	♀	139	29
34636	♀	139	26
34637	♀	144	31
34638	♀	138	29
34876	♀	136	31
34879	♀	140½	29
34880	♀	141	31

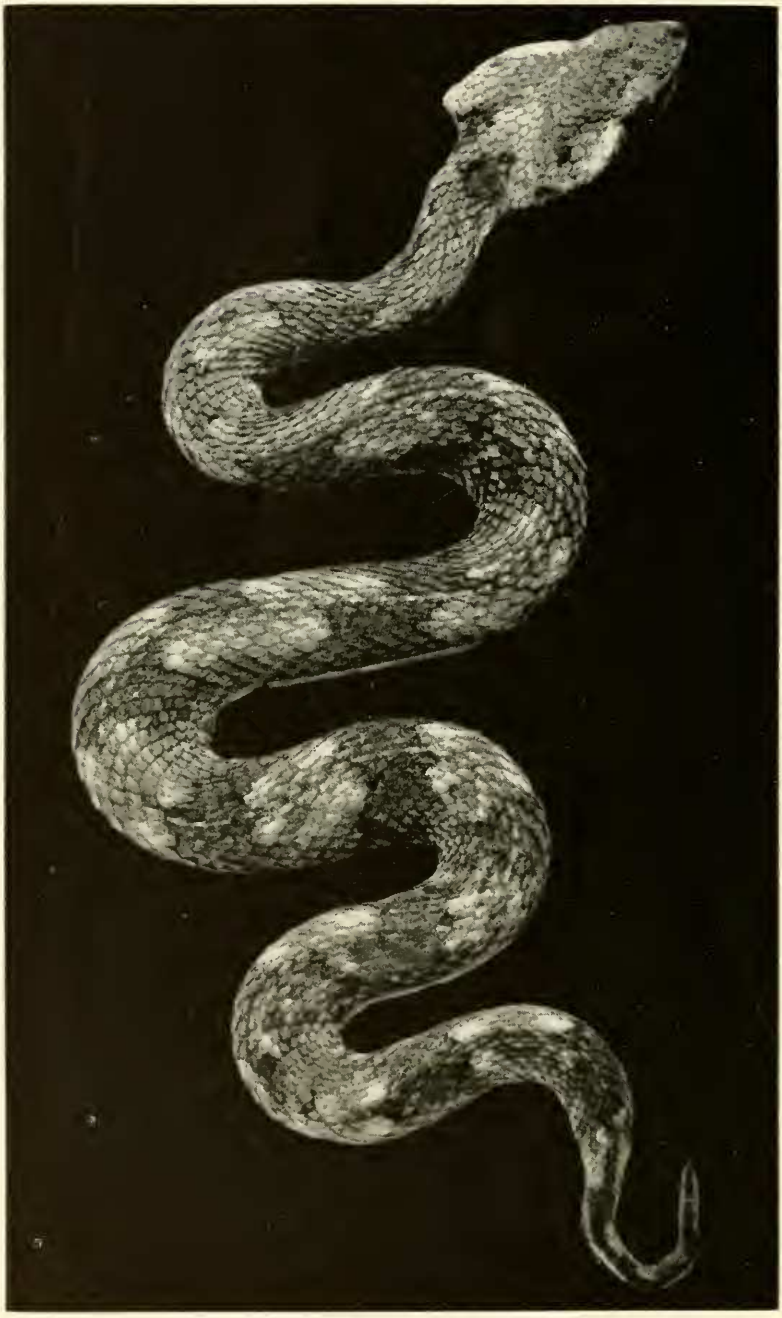

FIG. 34. *Bothrops nasutus* Bocourt. K.U.M.N.H. No. 34636; unknown locality, Costa Rica. (About natural size.)

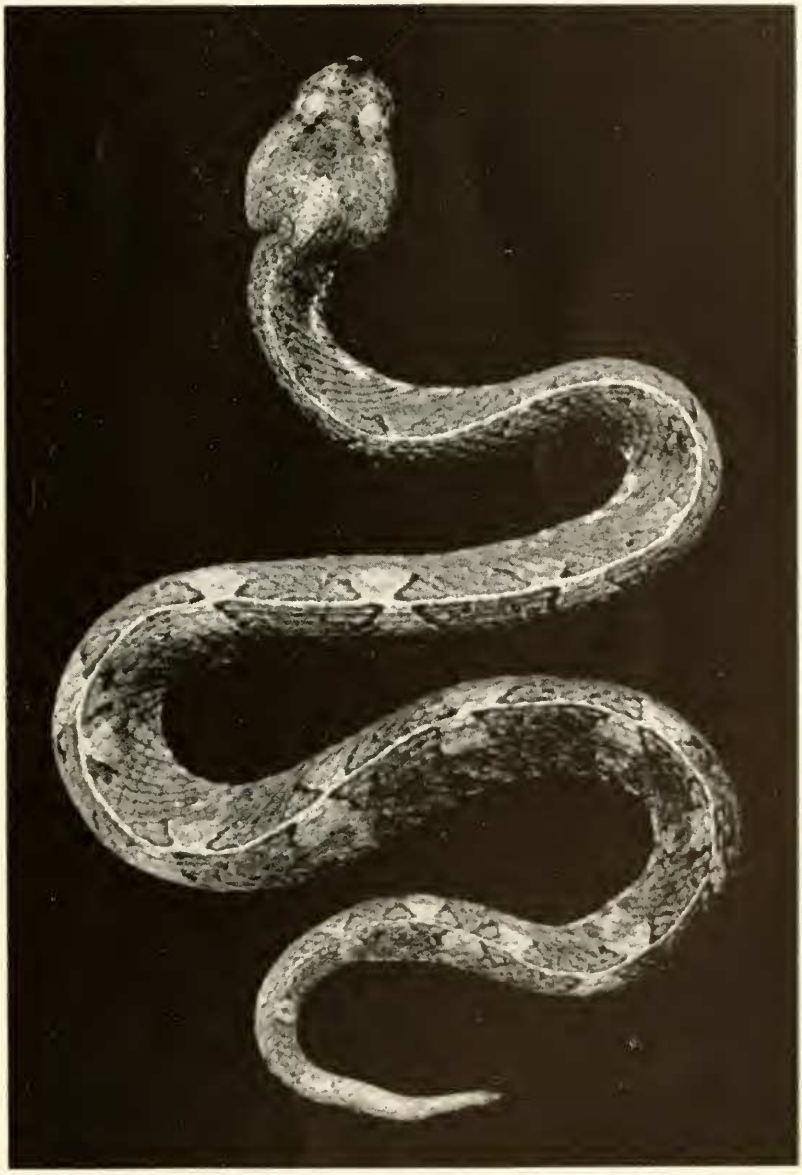

FIG. 35. *Bothrops ophryomegas* Bocourt. K.U.M.N.H. No. 34006; unknown locality, Costa Rica. (Actual total length, 498 mm.)

Bothrops ophryomegas Bocourt

Fig. 35

Bothrops ophryomegas Bocourt, Ann. Sci. Nat., ser. 5, vol. 10, 1868, p. 201 (type locality, west slope of Escuintla Range, Guatemala); Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, p. 178.

A young living specimen was presented to me by Sr. Alfonso Trejos of the Hospital San Juan de Diós, San José, Costa Rica. The specimen is of unknown provenance, but is presumed to have been sent from the west coast of Costa Rica. The following characters obtain (K.U.M.N.H. No. 34006): rostral distinctly higher than wide, visible above at a point; a pair of diminutive internasals, and somewhat larger supranasals (anterior canthals); a canthal connects this scale with the large upper preocular; canthal line sharp; supraoculars large, separated by six scale rows; about 23 scales on the top of snout; nasal large, divided, the posterior part small, subcircular, its posterior edge elevated somewhat; four small loreals; two rows of scales between the very narrow elongate subocular and the labials; one row between labials and the scales bordering the lateral pit; three preoculars; supralabials, 10-9, the fourth and fifth largest; infralabials, 10-10, four bordering first chinshields, which are larger than second pair; two somewhat enlarged rows of temporals. Scale formula: 25, 21, 21, 19, all except outer row keeled, the scales of the anterior part of body with distinct paired apical pits. Ventrals, 160; subcaudals (single), 42; anal single. A pattern of paired blotches, separated by a median hair-fine white line, with smaller lateral series of spots on the third and fourth scale rows, and a second series of spots on first row that touches the ventrals; venter generally brown, each ventral with two or three lighter areas; a dim light line from below eye to lip, with a second narrow line on the ventral scales below and behind jaw angle.

Bothrops nigroviridis nigroviridis (Peters)

Bothriechis nigroviridis Peters, Monats. Akad. Wiss. Berlin, 1859, p. 278, pl. fig. 4, (type locality, Costa Rica).

Bothrops nigroviridis nigroviridis Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 176-177.

A specimen, K.U.M.N.H. No. 31954, from above San Isidro del General (Pacific slope) was obtained from Sr. Lic. Oldemar Chavarría Ch. The exact elevation is unknown.

This specimen, somewhat discolored by preserving fluid, is other-

wise in a good state. There are several points in which this specimen differs from the one * listed in my previous review.

Snout rounded anteriorly; nasals separated by a single minute scale; supranasals enlarged, followed by a larger canthal, the two scales with upturned outer edge; canthal touching upper preocular but separated from supraocular by a single scale; supraoculars notched on inner border with an enlarged scale inserted in notch; 7-10 scales between the supraoculars; about 15 scales occupy top of snout other than those mentioned; nasal large, sutured above nostril; eight scales in loreal region, two separating the nasal from upper preocular; pit surrounded by a lower preocular and three other scales, lower one smallest; on right side, subocular fused together to form a very elongate scale; on left side, three suboculars; three postoculars; supralabials, 9-9; infralabials, 10-11, three touching chinshields; anterior chinshields three times size of second pair; scale formula, (25-21), 21, 19, 17, 17; ventrals, 158; subcaudals, 57, first divided, others single; anal entire.

Chin and throat yellow with a very slight suggestion of pigment at certain points on infralabials. Pigment at certain points on supralabials. Scale on side of head with some black flecks. Greatest diameter of pit about four fifths of the eye diameter. Total length, 725 mm., tail, 102 mm.

Barbour and Loveridge (Bull. Antiv. Inst. Amer., vol. 3, no. 1, 1929, p. 2, fig. 1) have separated *Bothrops n. marchi* of Honduras as a subspecies. It may be significant that the ventral-subcaudal count of this female specimen (158, 57) approaches their figures given for *marchi* (158-163, subcaudals 51-63) more than counts given for *n. nigroviridis* (134-146, 49-54) by these authors.

The presence of black markings on the dorsum and head, and the black diagonal stripe behind the eye, distinguish it from *n. marchi*.

Bothrops lateralis (Peters)

Fig. 36

Bothriechis lateralis Peters, Monatsb. Akad. Wiss. Berlin, 1852, p. 674 (type locality, Costa Rica).
Bothrops lateralis Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 175-176.

A mutilated specimen of this species was found about seven miles southwest of Villa Quesada, Costa Rica, July 11, 1951. As far as can

* Through a metathesis of data in cataloguing, this specimen was recorded in the above publication from Isla Bonita. It was actually taken at Boquete Camp on the Pacific slope of Cerro de la Muerte at 5,500 ft. elevation, the collector, Mr. Virgil Cave.

be discerned the specimen agrees with the characters of the species within the limits of known variation.

A specimen, K.U.M.N.H. No. 25688, from Santa Cruz, Volcán Turrialba, is figured.

FIG. 36. *Bothrops lateralis* (Peters) K.U.M.N.H. No. 25688; Santa Cruz, Volcán Turrialba, Costa Rica. (Actual total length 603 mm.)

Bothrops schlegelii schlegelii (Berthold)

Figs. 37, 38

Trigonocephalus schlegelii Berthold, Abh. Ges. Wiss. Göttingen, vol. 3, 1846, p. 13, pl. 1, figs. 5-6, (type locality, Colombia).
Bothrops schlegelii Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 173-175.

FIG. 37. *Bothrops schlegelii schlegelii* (Berthold). K.U.M.N.H. No. 31999, Turrialba, Costa Rica, young; actual total length, 355 mm.

FIG. 38. *Bothrops schlegelii schlegelii* (Berthold). K.U.M.N.H. No. 34002, Costa Rica, Yellow form. *"Oropel";* actual total length, 567 mm.

Several specimens of this puzzling species were acquired. They are from the following localities: K.U.M.N.H. Nos. 30953, 30954, 31999, 34000, Turrialba; Nos. 31996, 31998, San Isidro del General; No. 34003, Tenorio, Las Cañas, Guanacaste; No. 34845, Golfito; Nos. 34001, 34002, 34004, from unknown Costa Rican localities.

The specimen No. 34004 is the largest I have seen, measuring 745 mm. in total length, the tail 117 mm. Specimens from Turrialba have a lower total ventral count than the Pacific drainage specimens. However, this may be largely sexual since most of the western specimens are males.

No. 34002, a specimen of the yellow form is figured. It is Costa Rican but the locality is unknown. The specimen was presented to me alive by Sr. Alfonso Trejos. No. 31999, a young specimen is also figured.

Scale data on *Bothrops schlegelii* (Berthold)

Number	*Sex*	*Ventral*	*Sub-caudals*	*Totals*	*Scale formula*
30953	♀	153	48	201	25-23-23-21-17
30954	♀	155	54	209	25-23-23-21-17
31999	♂	153	56	209	25-23-23-19-17
34000	♀	150	50	200	25-23-23-19-17
31996	♂	164	54	218	25-23-23-19-17
31998	♂	163	58	221	25-21-21-19-15
34003	♂	160	59	219	25-23-23-21-17
34845	♂	166	61	227	25-23-23-21-17
34001	♂	159	61	220	23-23-23-21-17
34002	♂	155	50	205	25-23-23-21-17
34004	♀?	156	53	209	25-23-23-21-17

Bothrops schlegelii supraciliaris subsp. nov.

Fig. 39

Type: K.U.M.N.H. No. 31997; mountains near San Isidro del General, San José Province, Costa Rica. Collector and date unknown.

Diagnosis: A subspecies having soft spines above the eye but differing from known forms of *schlegelii* in having two supraoculars on each side, each with small soft, spiny processes; a row of elevated scales border the canthus, subcaudals partly single, partly divided, the latter third of tail orange; most scales of outer row ivory or partly ivory in color, none on second row; chin white, unpigmented; postorbital stripe narrow, bordered above by white. Thirty-seven light, dark edged blotches on dorsal part of body.

Description of type: Front of snout rounding, covered by about 70 strongly keeled scales anterior to level of the supraoculars; rostral approximately as wide as high, not visible above; on canthus a tiny

median scale above rostral; each undivided nasal bordered above by three scales with free outer edges; loreal separated from the upper preocular by one small scale; these three scales bordered above by five scales, three of which have the keels strongly elevated into soft flattened "spines" and forming a line with the two elevated supraorbital spines; the supraoculars divided, each bearing one or two small spinelike outer projections; supraoculars separated from the eyes by a row of ten small granular scales; the next row consists of about five scales, two of which are the elevated supraorbital spines, this row separated from orbit by eight or nine small granules, two or three small postoculars; a long narrow subocular runs under orbit to or very close to the lower preocular; three preoculars, the median and lower border pit; second labial separated from lower preocular by a small scale, broadly entering pit and with a scale bordering it above forms the anterior border of pit; the second labial has no partial suture entering from its anterior edge; three to five small lower loreals (prefoveals); 9-10 supralabials, the first continuously bordering the nasal; the third, fourth, fifth, and sixth separated from the subocular by three scale rows; infralabials 12-12, only two of which touch the first chinshields; first pair of chinshields much larger than three following pairs, but distinctly smaller but perhaps a little wider than the first pair of labials; temporal scales keeled strongly, the keels compressed and elevated; about 56 scales across head at angle of jaws; no scales between nasal and rostral.

Scale formula: 25, 23, 23, 23, 19, 19; ventrals (counting from first widened scale), 146; subcaudals 46, anal single; the terminal scute of tail rather large; the tail at tip with six rows of scales; 15 in postanal region; all scales except outer row, and scales on under side of head, keeled.

Color: Bluish to bluish green with a series of 57 dorsal spots of gray fawn, bordered with black; many of the light scales with black dots; blotches occasionally broken and alternate; laterally they reach to third scale row over much of the body; head bluish with a median light black-edged spot on the snout; two diagonal light stripes extend from interorbital region to the temporal region, the edges black dotted; a pair of diagonal occipital light spots; a narrow black streak from eye to jaw angle bordered above by a cream line; chin yellowish white save for olive black marks on the tip of chin and near mouth angle; throat and anterior third of body ivory white with outer edges of ventrals dark olive-gray and a few scat-

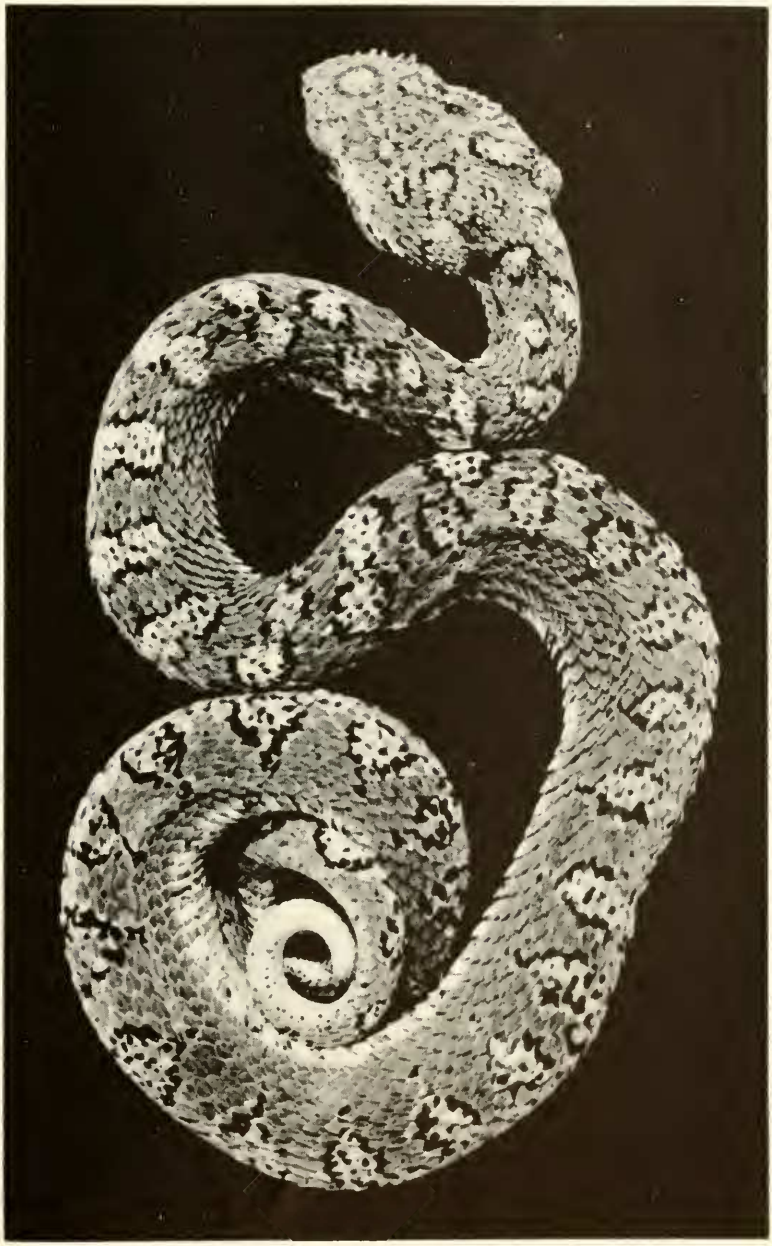

FIG. 39. *Bothrops schlegelii superciliaris* subsp. nov. Type K.U.M.N.H. No. 31997, mountains near San Isidro del General, San José Prov., Costa Rica. (About natural size; actual length, 400 mm.)

tered black dots, which grow thicker until at midpoint the venter is nearly uniformly grayish black, except for some ivory spots under tail. Outer scale row with most of the scales ivory or partly of this color, suggesting a more or less continuous line.

Measurements: Snout to vent 340; tail 60; total length 400; width of head 18; length of head 24.

Remarks: It is not at all certain that this should be regarded as a subspecies of *schlegelii* occurring as it does on the Pacific slope with two color forms of that species.

I first saw this specimen in a collection at San Isidro del General, in 1947, then recently preserved in alcohol by Lic. Oldemar Chavarría Ch. pharmacist of San Isidro del General. In 1952 I obtained it from him through an exchange of specimens. The snake had been brought into the pharmacy by a customer, living in the town but it was caught in the mountains at an unknown elevation. The collector's name was not remembered.

In the collection of Sr. Charvarría were some 20 other herpetological species collected in and about San Isidro del General and El General. I am under deep obligation to him for exchanging this and certain other specimens and for presenting me with several other snakes and lizards as well.

Since both the yellow and dark forms of *schlegelii* also occur in the Pacific drainage, one suspects that this form may be isolated geographically, occupying a higher range on the mountain. A comparison of the two with the present species is warranted.

	Schlegelii schlegelii	*Schlegelii supraciliaris*
Ventrals	160-166	146
Subcaudals	54-61	46
Total count male	218	. .
Total count female	. .	192
Color:	Dark olive with a dorsal pattern of brown spots; dorsolateral small yellow spots. Brown spots with ivory spots on outer row and venter (or yellow).	Blue greeen with light fawn black edged marks
Scale formula at vent reduces to	17	19
Ventrals single	yes	Partly divided (5).
Lateral part of tail	dark	Orange
Supraocular	single	Paired
Canthal scales with soft spines	Not or scarcely indicated.	Strong spines a little less than eye spines in size.
White spotting	Two outer rows	Outer row only, the series nearly continuous.

Crotalus durissus durissus (Linnaeus)

Fig. 40

Coluber durissus Linnaeus, Systema Naturae, Ed. 11, vol. 1, 1766, p. 372 (type locality, designated Jalapa, Veracruz, Mexico, by Smith and Taylor).
Crotalus terrificus durissus Taylor, Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951, pp. 183-184.

Three young specimens are at hand. Two are part of a litter, born in captivity, and presented to me by Sr. Alfonso Trejos. The third was taken at Tenorio, Guanacaste, Costa Rica. These are K.U.M. N.H. Nos. 31916, 31917, and 31918 respectively. The color pattern is indicated in the figure here given. The scale variations are indicated in the following table:

No.	*Supralabials*	*Infralabials*	*Scale formula*	*Ventrals*	*Subcaudals*
31916	15-15	16-14	31-27,23,17	173	32
31917	16-15	15-16	31-25,23,19	172	32
31918	14-14	14-16	31-27,25,23,19	170	34

The conformation of the head scutes are almost identical in the three specimens as is the color pattern. In all, the first, fourth, and last supralabials are the largest. The first subcaudal is divided in one, the last divided in two specimens.

Details of the head squamation of No. 31918 follows: Internasals large, quadrant-shaped, their length but slightly less than prefrontals; latter a little wider than long, their back edges thickened and somewhat tubercular; the interorbital area occupied by five scales, a larger regular anterior pair, a smaller posterior pair, with a small intercalated scale between the four; supraoculars very large with a small "parietal" back of supraocular separated from its fellow by two small scale rows. Two small scales between large postseminasal and the supraocular; two large preoculars, the lower with two other scales surround the pit; two loreals; six small scales in front of pit; three below it. Preseminasal larger than the postseminasal; one post- and three suboculars (2 post-, 4 suboculars). Two scale rows between labials and suboculars.

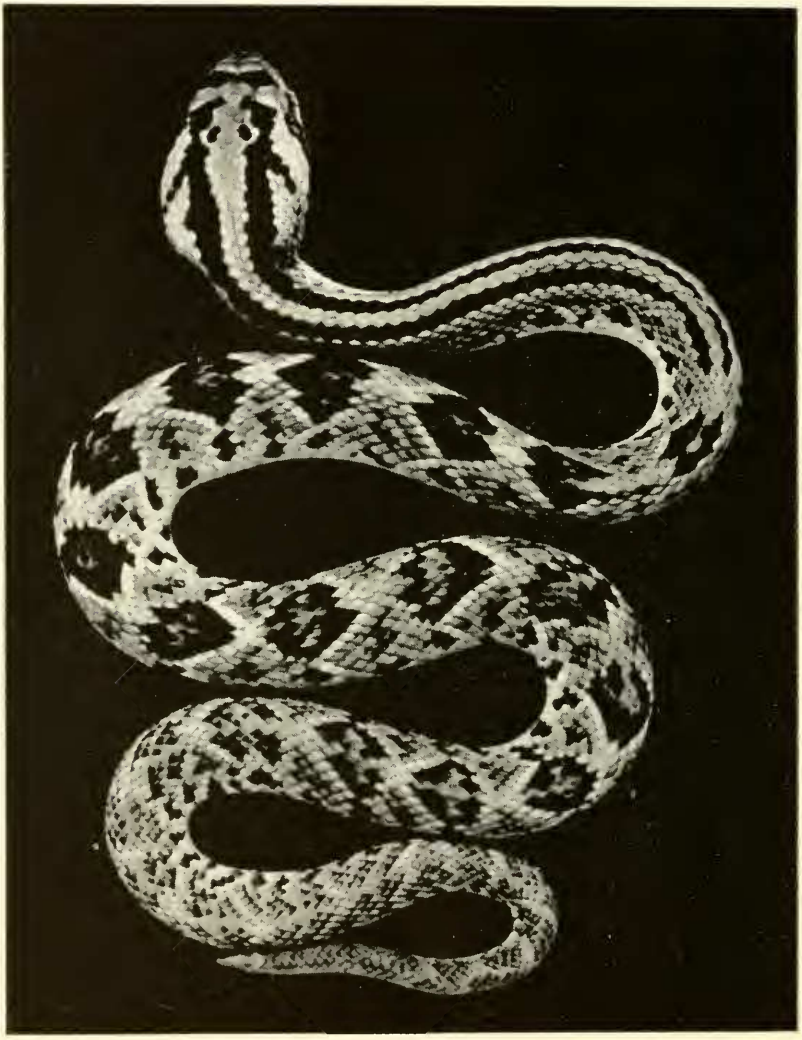

FIG. 40. *Crotalus durissus durissus* (Linnaeus). K.U.M.N.H. No. 31918; Tenorio, Las Cañas, Guanacaste Prov., Costa Rica. (Total length, 417 mm.)

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ERRATA

Univ. Kansas Sci. Bull., vol. 34, pt. 1, no. 1, Oct. 1, 1951.

(This number went through press while I was in Costa Rica and was not adequately corrected and proof read.—E. H. T.)

Page 5, line 11, for "*sp. nov.*" read "*subsp. nov.*"

Page 20, line 25, for "Neoparias" read "Neopareas," also p. 37, line 34; p. 66, lines 4, 5, 6, 10, 11, 12.

Page 21, line 44, for "*serperastra*" read "*serperaster*"; also p. 11, line 26, and lines 37, 38.

Page 24, line 14 for "L'iconographie" read "Iconographie."

Page 30, line 35, for "*Nothopis*" read "*Nothopsis.*"

Page 31, line 7, for "Morehead" read "Morehouse," also p. 32, line 1; p. 43, line 31; p. 63, lines 11, 18; p. 64, line 2; p. 107, line 27; p. 109, line 9.

Page 33, line 39, for "*rugosa*" read "*rugosus*"; also p. 34, line 1.

Page 35, line 13 for "Hemicognathus" read "Henicognathus."

Page 38, line 28 for "15 rows" read "15 or 17 rows."

Page 39, line 22 for "Calophrys" read "Colophrys."

Page 43, line 22, for "dolichocephalus" read "dolichocephalum."

Page 51, line 9 for "at" read "et."

Page 56, line 3, insert "p. 216" after "1910."

Page 72, line 18, for "4 scale pits" read "2 scale pits" and delete following ten words.

Page 81, line 13, for "1391" read "1931."

Page 84, line 37, insert "1854" at beginning of line.

Page 86, line 13, for "Equador" read "Ecuador."

Page 92, line 32, for "one species is" read "two species are."

Page 97, line 9, for "row" read "rows."

Page 118, line 19, delete, "?".

Page 122, line 2, after "vol. 31" insert "Dec. 23, 1893, p. 347"; delete "333"; line 27, for "Tail blackish red, spotted" read "tail blackish, red spotted."

Page 125, line 11, for "Leptodeira" read "Leptodira"; also 126, line 2.

Page 134, line 3, for "the region about Turrialba" read "Isla Bonita."

Page 142, between line 34 and line 35 insert "pl. IV, fig. 1."

Page 149, line 1, for "strips" read "stripes."

Page 154, line 18, for "1873" read "1872."

Page 172, line 30, for "Barsiliensium" read "Brasiliensium."

Page 176, for "Isla Bonita at about 5,500 ft. elevation" read "San Isidro del General."